TRAINING SUPPORT PACKAGE (TSP)

TSP Number / Title	551-HEAT-CREW / Crew High Mobility Multipurpose Wheeled Vehicle (HMMWV) Egress Assistance Trainer (HEAT)
Effective Date	1 April 2007
Supersedes TSP(s) / Lesson(s)	
TSP Users	ANCOC, BNCOC, BOLC, Unit Training
Proponent	The proponent for this document is the Transportation School.
Improvement Comments	Users are invited to send comments and suggested improvements on DA Form 2028, *Recommended Changes to Publications and Blank Forms.* Completed forms, or equivalent response, will be mailed or attached to electronic e-mail and transmitted to: U.S. Army Combined Arms Support Command Transportation Training Division 401 1st Street Suite 227 Fort Lee, VA 23801-1511 e-mail: asat-lee@lee.army.mil
Security Clearance / Access	Unclassified
Foreign Disclosure Restrictions	FD5. This product/publication has been reviewed by the product developers in coordination with the Fort Lee, Va foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

PREFACE

Purpose

This Training Support Package provides the instructor with a standardized lesson plan for presenting instruction for: The Army standardized training program for the HMMWV Egress Assistance Trainer (HEAT).

This TSP Contains

TABLE OF CONTENTS

High Mobility Multipurpose Wheeled Vehicle (HMMWV) Egress Assistance Trainer (HEAT)
551-HEAT / Version 1.0
1 Apr 2007

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson

Course Number	Version	Course Title

Task(s) Taught(*) or Supported

Task Number	Task Title

Reinforced Task(s)

Task Number	Task Title
071-326-0502	Move Under Direct Fire
071-326-0503	Move Over, Through, or Around Obstacles (Except Minefields)
071-326-3002	React to Indirect Fire While Mounted
071-326-3013	Conduct a Tactical Road March
071-329-1030	Navigate From One Point on the Ground to Another Point While Mounted
071-410-0002	React to Direct Fire While Mounted
081-831-0101	Request Medical Evacuation
081-831-1000	Evaluate a Casualty
081-831-1040	Transport a Casualty Using a One-man Carry
081-831-1041	Transport a Casualty Using a Two-man Carry or an Improvised Litter
113-571-1022	Perform Voice Communications
113-637-2001	Communicate Via a Tactical Radio in a Secure Net
551-721-1359	Operate a Vehicle in a Convoy
551-721-1361	Operate Vehicle Under Adverse Conditions
551-721-1410	Read Strip Maps
551-721-2408	Implement Defensive Procedures When Under Attack/Ambush in a Truck Convoy
805C-PAD-2060	Report Casualties
850-001-2000	Employ Accident Prevention Measures and Risk Management Process
850-001-3001	Control Mission Safety Hazard

Academic Hours

The academic hours required to teach this lesson are as follows:

	Resident Hours/Methods	
	1 hr 35 mins	/ Conference / Discussion
	25 mins	/ Conference/Demonstration
	1 hr	/ Practical Exercise (Performance)
Test	0 hrs	
Test Review	0 hrs	
Total Hours:	3 hrs 00 mins	

Test Lesson Number

	Hours	Lesson No.
Testing (to include test review)		N/A

Prerequisite Lesson(s)

Lesson Number	Lesson Title
None	

Clearance

Security Level: Unclassified

Access

Requirements: There are no clearance or access requirements for the lesson.

Foreign Disclosure Restrictions

FD5. This product/publication has been reviewed by the product developers in coordination with the Fort Lee, VA foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

References

Number	Title	Date	Additional Information
AR 385-40	Accident Reporting and Records	01 Nov 1994	
AR 385-55	Prevention of Motor Vehicle Accidents	12 Mar 1987	
CALL HANDBOOK #06-31	Uparmored HMMWV Rollover Prevention and Egress Trainer	01 Aug 2006	
CFLCC TC 21-305-4.1	Tactics, Techniques and Procedures (TTPs), Program of Instruction (POI), and Crew/Battle Drills for High Mobility Multipurpose Wheeled Vehicle (HMMWV) Egress Assistance Trainer (HEAT).	27 Feb 2006	
DA PAM 385-1	Small Unit Safety Officer/NCO Guide	29 Nov 2001	
FM 21-305	Manual for the Wheeled Vehicle Driver (AFMAN 24-306)	27 Aug 1993	
FM 4-01.45	Multi-Service Tactics, Techniques, and Procedures for Tactical Convoy Operations MCCRP 4-11.31H; AFTTP(I) 3-2.58; NTTP 4-01.3	24 Mar 2005	
FM 5-19	Composite Risk Management	21 Aug 2006	
GTA 55-03-030	Emergency Procedures (Rollover Drills)	01 Oct 2006	
TC 21-305	Training Program for Wheeled Vehicle Accident Avoidance	19 Aug 1996	
TC 21-305-4	Training Program for the High Mobility Multipurpose Wheeled Vehicle	31 May 1991	
TC 55-HEAT	Training Program for the HMMWV Egress Assistance Trainer (HEAT)	TBD	
TM 9-2320-280-10	Operator's Manual for Truck, Utility: Cargo/Troop Carrier, 1-1/4 Ton, 4X4, M998; M998A1; Truck, Utility: Cargo/Troop Carrier, 1-1/4 Ton, 4X4, w/Winch, M1038; M1038A1; Truck, Utility: Heavy Variant, 4X4, M1097; M1097A1; M1097A2; Truck, Utility	31 Jan 1996	
TM 9-2320-387-10	Operator's Manual for Truck, Utility: S250 Shelter Carrier, 4X4 M1113, Truck Utility: Up-Armored Carrier, 4X4, M1114,	17 Oct 1997	

Student Study Assignments

None

Instructor Requirements

HEAT operators must be trained and certified by competent personnel. As such, commanders must determine who is qualified to train the HEAT operator(s). Commanders may assign other competent personnel (military, civilian technician, or contractors) as HEAT I/Os. Ideally, someone who is already a driver trainer or has experience as an instructor or safety officer/NCO may be designated by the commander as a HEAT I/O. I/O's must be selected not only for their technical qualifications but also for their demonstrated performance, objectivity, and ability to observe and provide constructive comments. Qualification training for HEAT I/Os will be conducted using the following guidance:

a. Individuals conducting HEAT training must be trained and certified by a HEAT I/O.

b. Initial qualification training will consist of, as a minimum, hands-on training of all tasks the operator is authorized to perform. Special emphasis will be placed on Academic and Performance Phase Learning Objectives and appropriate PMCS. Annually, all HEAT operators and HEAT I/Os must demonstrate a working knowledge and understanding of the appropriate subject areas in the HEAT Training Manuals and the ability to administer the commander's HEAT training program.

c. The initial/annual evaluation will determine the HEAT operator's ability to train other personnel and perform essential tasks to the prescribed standards. HEAT I/Os may evaluate the HEAT operator(s) by observing the performance of the prescribed duties or by functioning as a crewmember undergoing HEAT training by the HEAT operator, in order to evaluate the effectiveness of the HEAT operator's instruction.

d. HEAT I/Os will be issued a DD Form 1902, Certificate of Qualification as evidence of their qualification and designation and training must be annotated on operator's DA Form 348.

Additional Support Personnel Requirements

Name	Stu Ratio	Qty	Man Hours
Combat Life Saver (Enlisted)	1:15	1	2 hrs

Equipment Required for Instruction

Id Name	Stu Ratio	Instr Ratio	Spt	Qty	Exp
4130-01-458-8679 HAZARDOUS WASTE VAC			No	1	Yes
4240-01-433-8719 Goggles, Safety, Fog-Free	1:5		No	0	Yes
4720-01-168-0609 HOSE ASSEMBLY, WATER			No	1	Yes
*55-62 High Mobility Multipurpose Wheeled Vehicle (HMMWV) Egress Assistance Trainer (HEAT)	1:15		No	0	No
6515-01-371-6418 GLOVES, UTILITY, MEDICAL			No	10	Yes
7240-00-160-0438 CAN, TRASH AND GARBAGE			No	1	Yes
8465-00-254-8803			Yes	1	Yes

	WHISTLE, BALL					
	* Before Id indicates a TADSS					

Materials Required

Instructor Materials:
This TSP, TC 55-HEAT

Student Materials:
HEAT trainees will report wearing boots, Army combat uniform/desert combat uniform, protective eye wear (mandatory), helmet, body armor, personal and any crew-served weapon(s), protective masks (as required by the unit), LBE/V, and any other equipment that would typically be worn while riding in an uparmored HMMWV in a combat zone. It is also suggested HEAT participants wear knee and elbow pads during training.

Classroom, Training Area, and Range Requirements

General Instruction Building

Ammunition Requirements

Id	Name	Exp	Stu Ratio	Instr Ratio	Spt Qty
None					

Instructional Guidance

NOTE: Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identifying reference material.

All Students **must** fill out the HEAT Training Participant Screening Sheet. This form must then be reviewed by the instructor and forwarded if necessary for approval prior to the start of training.

The senior HEAT Instructor may augment (not substitute) the cadre with the use of safety observers – briefed to perform that function – from observers waiting to ride in the device, or those crewmembers who have already undergone training in the device.

Proponent Lesson Plan Approvals

Name	Rank	Position	Date
Woolf, Samuel	GS-14	Chief, Move Division	01 Apr 2007
Keyser, Burton	GS-12	Training Developer	01 Apr 2007

SECTION II. INTRODUCTION

Method of Instruction: Conference / Discussion
Instructor to Student Ratio is: 1:15
Time of Instruction: 5 mins
Media: Large Group Instruction (LGI)

Motivator

SHOW SLIDE 1: SHOW SLIDE 1: An AMSAA study of HMMWV rollover accidents at the end of FY 05 revealed that "During the two years that has defined OIF/OEF there have been (34) Class A rollovers. During the entire (18.5) year span of the HMMWV data … there have only been (30) class A rollovers." The same study also found that OIF/OEF HMMWV accident rates are 12 to 42 times greater than non-OIF/OEF. A study reported by *Helicopter World* (now *Defense Helicopter)* magazine in September 2000 said a person who is "egress trained" stands a 250 percent greater chance of survival than an untrained occupant when faced with a rollover egress emergency.

Teaching Soldiers, under controlled training conditions, the proper procedures to egress from an inverted high mobility multipurpose wheeled vehicle (HMMWV) will allow them to achieve self-control and overcome the natural fear and panic following the vehicle rollover. It will also reduce casualties and fatalities resulting from such rollovers, even when the vehicle is under attack, underwater, or on fire.

Show TRADOC Heat Video **(CLICK BOX TO BEGIN MOVIE)**

SHOW SLIDE 2:

Terminal Learning Objective

NOTE: Inform the students of the following Terminal Learning Objective requirements.

At the completion of this lesson, you [the student] will:

Action:	Perform clearing and egress procedures with the HEAT.
Conditions:	In the HEAT wearing required combat equipment, given instruction on actions to take to preclude and reactive measures during/after a HMMWV rollover as a HMMWV crewmember.
Standards:	Properly evacuate the HEAT while adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.

Safety Requirements

Safety Note: Of all the vehicle occupants, the likelihood of injury to the gunner is disproportionately higher than those of the others. Knowing the fundamental purpose of the HEAT, those occupying the gunner position must exercise particular diligence in securing occupant restraints, bracing for the rollover, and be particularly mindful of the increased potential for head and neck injuries - even in the device.

Medical pre-screening. HEAT training undertaken while being treated by prescription medications, must be done so with the knowledge and approval of the treating physician.

Safety hazard awareness notice. A potential for a mishap during HEAT training is acknowledged. In order to ensure the safety of staff and HEAT Training participant(s), the following considerations will be addressed. Be alert for those who appear to be experiencing difficulty. In the event of motion discomfort, the individual – or the unit to which the individual belongs – will be responsible for cleaning the physical evidence (i.e., the release of *any* bodily fluid or compound) of such discomfort before training will continue.

Hazardous conditions and control measures. Students must be informed of any known hazardous conditions and control measures that exist in the training environment. All watches, rings, and jewelry worn around the neck shall be removed; pagers or cell phones removed; and all pockets emptied of contents – particularly pens, pencils and pocket knives. Earrings should be removed to prevent inadvertent tearing of the earlobe during inversion and egress from the device. Crewmembers must be briefed of their responsibility to report any unsafe/unhealthful condition they may discover. The instructor will identify the location of emergency equipment, fire exits, and local procedures to be used in the event of a fire, injury, or other emergency. In the event of an **in-HEAT emergency**, (**three blasts** on the whistle or sounding of applicable alarm) **exit the HEAT** immediately and proceed to the pre-designated location. A single long blast is an indication to remain inside the device and *not* open the doors.

First aid treatment includes oxygen (O) administration, treatment for shock, Cardiopulmonary Resuscitation (CPR) when needed, and transport to the nearest medical treatment facility IAW the Pre-Mishap Plan (Handout).

Pre-training requirements. Prior to engaging in HEAT training, personnel shall be proficient with the wear and operation of standard uniform and combat equipment worn in the theater, and be familiar with survival, signaling and rescue techniques appropriate to survival situations typical of disabled vehicles in the AOR.

Emergency medical personnel. There will be a minimum of one Combat Lifesaver (CLS) on site during any operation of the HEAT. Ideally, CLS services will be provided by the unit undergoing the training. Emergency medical personnel with appropriate equipment and a suitable vehicle for transport will be readily available during all HEAT training. The absence of any criteria in this paragraph requires an additional risk assessment, and the approval of the appropriate risk approval authority.

Safety reminder. All personnel will be reminded that personal injury, death, or equipment damage can result from carelessness, failure to comply with the approved procedures, or violations of warnings, cautions, and safety regulations.

HEAT location safeguards. The HEAT device will be isolated from passers-by to prevent accidental striking by the device when it is in motion.

Risk Assessment Level

Moderate - CRM is a decision-making process used by leaders to mitigate risks associated with all hazards that can injure or kill people, damage or destroy equipment, or otherwise impact mission effectiveness. CRM must be accomplished using appropriate composite risk management worksheet in the Handout section of this TSP prior to the conduct of this training.

Environmental Considerations

NOTE: It is the responsibility of all Soldiers and DA civilians to protect the environment from damage.

Environmental Exposure – Aircrew members should not participate in flight duties for at least eight hours after completion of HEAT training to ensure stability in the otolith organs (inner ear) of the vestibular system, Aviation/Flight Safety Program and Aviation Accident Prevention Plan {AAPP}, Para. 4-9d (1); and FM 3-04.301 Aero Medical Training for Flight Personnel, Chapter 9.

Evaluation

Instructional Lead-In

SHOW SLIDE 3:

Knowing what actions to take immediately prior to a potential rollover and immediately following a rollover are vital to the safety of the vehicle's crew. Rollover battle drills routinely performed by the vehicle's crew, create understanding of the violent chaos that results when a rollover has occurred and develop skills needed to react to it..

SECTION III. PRESENTATION

NOTE: Inform the students of the Enabling Learning Objective requirements.

A. ENABLING LEARNING OBJECTIVE

ACTION:	Understand preventive measures to preclude rollover
CONDITIONS:	In a classroom, provided instruction on preventive and reactive measures, crewman duties and emergency steps to take in case of a vehicle rollover
STANDARDS:	Identify precautionary measures to take to prevent a HMMWV vehicle rollover by answering the check-on-learning questions posed by instructor with a minimum of 80%.

1. Learning Step / Activity 1. Identify Preventive Measures for Vehicle Rollover

Method of Instruction: Conference / Discussion
Instructor to Student Ratio: 2:15
Time of Instruction: 20 mins
Media: Large Group Instruction

SLIDE 4:

The critical rollover angle for a Combat Patrol-loaded M1114 is less than 30°, while the critical rollover angle for an up-armored HMMWV is 25° – less with higher-cg loads. Driving an uparmored HMMWV is vastly different than driving a HMMWV without armor. At gross vehicle weight (GVW), which is an unloaded uparmored HMMWV with four crewmembers and their gear, rapid steering at speeds as low as 40 miles per hour (mph) increases the likelihood of a rollover. Stability is further reduced by road conditions, such as sand, debris, gravel, or rain; overloading the uparmored HMMWV; cargo placed high in the vehicle which raises the vehicle's center of gravity; and driver inexperience or lack of training. Additionally, at 60 mph on smooth dry pavement an overloaded uparmored HMMWV has a braking distance of 15 vehicle lengths, compared to 13 vehicle lengths at GVW.

SLIDE 5: Elaborate on the following

Rollovers are caused by speed, inadequate training, high centers of gravity, terrain and road conditions, driving habits, and local conditions. However, with proper driver training and actions, leader involvement, and composite risk management, the number of rollovers can be significantly reduced.

a. **Senior vehicle occupant.** The senior occupant is responsible for ensuring all personnel riding in or on a vehicle are wearing seatbelts/restraints and that all required equipment inside the vehicle is properly stored and secured. Other requirements are as follows;

(1) Vehicle center of gravity. The height of a vehicle's center of gravity and the length of the wheelbase determine the vehicle's stability. This is a major contributing factor to vehicle rollovers. If the crew overloads the vehicle or does not load the heavier items on bottom, the center-of-gravity

will be raised higher. Every effort should be made to plan and load the vehicle to minimize this affect. If the load is off to one side of the vehicle handling will be adversely affected. This will not only prematurely wear on the vehicle components but will also tend to make the vehicle sluggish to control or drift from side to side.
(2) Load security. Improperly secured loads can change a vehicle's center of gravity and its stability. Bulk liquid tank trucks are inherently less secure as liquids can surge when trucks brake or go around curves, thereby altering the center of gravity. Also, a vehicle loaded with containers will have a higher center of gravity. It is important that payloads are secured as closely as possible to the lateral centerline of the truck or trailer bed. If the payload is not centered properly, the vehicle stability will not be equivalent when turning to both the right and left.
(3) Radius of curves and slope of roadways. These calculations are important because they generate a centrifugal force that acts sideways on the vehicle, thereby the hazard of rollover.
(4) Vehicle speed. This factor probably contributes the most to vehicle instability because it magnifies problems presented by the other three factors. As the vehicle's speed increases, the centrifugal force increases. Faster speeds also result in decreased driver response times. Of all the factors discussed above, the driver exercises control over speed. When maneuvering through curves or sudden traffic situations, a vehicle with a high center of gravity can easily turn over. Sudden vehicle maneuvers are especially risky because the combination of speed and load shift makes the vehicle unstable.
(5) Trailer towing. Vehicles towing trailers are much more prone to roll over, especially in curves and during sudden steering maneuvers, as a result of the exaggerated motion of the trailer.

b. **Vehicle condition and preparation.** It is critical the vehicle is in good operating condition before starting a mission. Pay particular attention to the condition of the tires and tire air pressure. Properly performed preventive maintenance checks and services (PMCS) is the best way to control this potential hazard.

SLIDE 6:

c. **Driver risk management control measures.** Every driver can take eight basic steps to prevent or reduce the potential for rollovers.

(Note: Commanders should include safety tips in initial and sustainment tactical wheeled vehicle operator training).

(1) Adjust the vehicle speed to allow a "speed cushion" for maneuvering (when approaching a curve reduce your speed by at least 10 miles per hour below the posted speed limit).
(2) Slow down.
(3) Avoid panic – don't jerk the steering wheel. Many rollovers occur when the driver panics and/or jerks the steering wheel during an emergency. At highway speed, jerking the steering wheel can cause loss of control and the vehicle may slide sideways and roll over.
(4) Observe speed limit and check speedometer to ensure vehicle is below the posted speed.
(5) Do not rely on a "seat of the pants" sense to judge speed and vehicle maneuverability. New suspensions and chassis set-ups give a false sense of control.

(6) Slowly accelerate out of the curve.
(7) Maintain a "space cushion" (distance between the vehicle and other traffic) so the driver has a safe maneuvering speed to compensate for errors in judgment, weather, road conditions, and poor driving by other motorists.
(8) Avoid the temptation to brake hard if the rear of the vehicle or trailer "slides out." Instead, if there is clearance, attempt to apply steady throttle, allowing the vehicle to straighten itself. Braking will accelerate the skid, contributing to loss of control and rollover.

Risk management procedures. All personnel are required to use vehicle restraint systems. It is recommended when operating tactical military vehicles during field training, driver's training, and tactical operations that the Kevlar/Advanced Combat Helmet (ACH) be worn at all times with chin strap properly secured.

SLIDE 7:

d**. Teamwork is another key to successful rollover prevention:**

• Work as a team.
• Maintain crew integrity.
• Communicate with the driver. Tell the driver what is to the left, right, rear, and overhead. Your gunner is your eyes and ears! The gunner may be the only crew member capable of seeing around the entire vehicle. Use the vehicle intercom system to pass visual information to the driver, but rehearse shouted voice commands and hand signals in case the intercom fails. Avoid hazards by using a ground guide whenever possible.
• Identify terrain or conditions favorable for a rollover.
• Use a guide near bodies of water.
• Position team members within the vehicle.
• Combat locks help keep the doors closed in a crash, but are a hazard near water! Unlock combat door locks when near water (enemy situation permitting).
• Know how to get out. Rehearse vehicle evacuation as if only one exit is available.

- Combat door locks on the M1114 Up armored HMMWV are designed to keep the enemy out. When locked they also make it extremely difficult for rescuers to enter the vehicle!
- Accident damage may also jam the door locking devices, making them impossible to open.
- If the doors cannot be opened by occupants or rescue team members and the vehicle is inverted in water too deep to allow air in the vehicle, the likelihood of drowning is high.
- In this case, rescuers must immediately attempt to roll the vehicle on its side using all available means (tow straps, rope, winch cables, etc.) to gain access to the turret.
- Leaders must decide, based on the enemy situation, whether or not to keep the doors locked when operating near any body of water (bridges over/roads adjacent to any canal, river, lake, pond, etc.).

2. Learning Step / Activity 2. Identify actions to take when rollover is imminent

Method of Instruction: Conference / Discussion

Instructor to Student Ratio: 2:15
Time of Instruction: 20 mins
Media: Large Group Instruction

SLIDE 8:

HMMWVs are fitted with armor as a means of reducing casualties from improvised explosive devices (IEDs) and small arms fire. Currently trucks in Iraq are not even allowed on the main and alternate supply routes unless they have Level I factory-produced armor (armor integrated into nearly every aspect of construction) or Level II add-on armor (ballistic steel plates and bulletproof windows). In addition, welding shops are adding "T-cups," additional armor surrounding the ring mount to protect the gunners. The additional protection the armor provides U.S. Soldiers from IEDs and small arms fire has its price. Uparmored HMMWVs are extremely-top heavy and vehicle rollovers have become a common and deadly occurrence.

Knowing what actions to take immediately prior to a potential rollover and immediately following a rollover are vital to the survival of the vehicle's crew.

Safety Note: Never attempt to leap from a rolling vehicle. Except for the gunner, ensure all vehicle occupants have their seat belts fastened. Ensure the gunner remains at the name tag defilade position with gunner's restraint system on when in the gunner's turret. Upon complete evacuation of all personnel, vehicle should be inspected for fire hazards such as leaking oil, fuel, ammunition and hydraulic fluid. Use the portable fire extinguisher when inspecting vehicle for leaks in case of fire, which could cause injury or death. If hazardous/explosive materials are involved, driver should take actions according to the DD Form 836 accompanying load. Notify rescue personnel and remain at evacuation distance while securing accident site.

SLIDE 9:

These steps should begin when the driver feels he has lost control of the vehicle and anticipates a rollover, but not into water.

a. Driver:
   (1) Releases the accelerator.
   (2) Shouts, **"Rollover, Rollover, Rollover!"**
   (3) Keeps hands on the steering wheel with arms extended but not locked.
   (4) Plants feet firmly on the floor.
   (5) Tucks head and chin into chest and braces for impact.
b. Vehicle commander (VC):
   (1) Shouts, **"Rollover, Rollover, Rollover!"**
   (2) Uses left hand to pull gunner into the vehicle.
   (3) Uses left hand and arm to hold the gunner in place.
   (4) Plants feet firmly on the floor while holding onto a stationary object.
   (5) Tucks head and chin into chest and braces for an impact.

SLIDE 10:

c. Gunner:
   (1) Shouts, **"Rollover, Rollover, Rollover!"**
   (2) Pushes/pulls self down into the vehicle.
   (3) Holds onto a stationary object.
   (4) Tucks head and chin into chest and braces for impact.

(5) **Does not place hands or fingers on turret.** Turret's movement can cause additional injuries.

d. Other crewmembers (if present):
(1) Shout, **'Rollover, Rollover, Rollover!"**
(2) Assist VC in pulling the gunner into the vehicle and hold him.
(3) Tuck heads and chins into chests and brace for impact.
(4) Hold onto a stationary object.

SLIDE 11:

When in the vicinity of water and tactical conditions permit:

a. VC:
(1) Informs vehicle crew that the vehicle is operating around water hazards.
(2) Reminds the crew of the risk mitigating measures.
(3) Unlocks the combat door locks.
(4) Ensures all loose gear and cargo are secured.

When water entry is imminent, whether or not the potential for a rollover exists, these steps should be followed:

b. Driver:
(1) Releases the accelerator and controls the entry by steering into the body of water.
(2) Yells **"Water!"**
(3) Keeps hands on the steering wheel with arms extended but not locked.
(4) Plants feet firmly on the floor.
(5) Tucks head and chin into chest and braces for impact.

SLIDE 12:

c. VC:
(1) Shouts, **"Water!"**
(2) Uses left hand to pull gunner into the vehicle.
(3) Uses left hand and arm to hold the gunner in place.
(4) Plants feet firmly on the floor while holding onto a stationary object.
(5) Tucks head and chin into chest and braces for an impact.

d. Gunner:
(1) Yells, **"Water!"**
(2) Pushes/pulls self down into the vehicle.
(3) Slides feet in the direction of the vehicle's movement.
(4) Plants feet firmly on the floor while holding onto a stationary object.
(5) Tucks head and chin into chest and braces for impact.
(6) **Does not place hands or fingers on turret.** Turret's movement can cause additional injuries.

e. Other crewmembers (if present):
(1) Shout, **"Water!"**
(2) Assist VC to pull gunner into the vehicle and hold him.
(3) Tuck head and chin into chest and brace for impact.
(4) Plant feet firmly on floor while holding onto a stationary object.

NOTE: Conduct a check on learning and summarize the learning activity.

CHECK ON LEARNING: Conduct a check on learning and summarize the ELO.

B. ENABLING LEARNING OBJECTIVE

ACTION:	Understand measures to take after rollover
CONDITIONS:	In a classroom, provided instruction on preventive and reactive measures, crewman duties and emergency steps to take in case of a vehicle rollover
STANDARDS:	Identify precautionary and reactive measures to take in case of a HMMWV vehicle rollover by answering the check-on-learning questions posed by instructor with a minimum of 80%.

1. Learning Step / Activity 1. Identify actions to take after a Vehicle Rollover (not in water)

Method of Instruction: Conference / Discussion
Instructor to Student Ratio: 2:15
Time of Instruction: 10 mins
Media: Large Group Instruction

SHOW SLIDE 13:

SLIDE 14:

1. **After rollover (not in water)**
   a. Each crewmember, whether driver, VC, or rear crew:
      (1) Braces one hand on the ceiling.
      (2) Unbuckles seatbelt with other hand and immediately puts both hands on ceiling.
      (3) Slides out of seat and sits up.
      (4) Disconnects headset.
      (5) Turns off motor (driver).
      (6) Orients self on the nearest door.
      (7) Unlocks combat door locks.
      (8) Opens door; if it does not open, try a different door.
      (9) Exits with weapon.
      (10) Assists remaining crew to exit.
      (11) Establishes security.
      (12) Checks for fires.
      (13) Activates fire extinguisher, as needed.
      (14) Recovers sensitive items.
      (15) Provides first aid.
      (16) Assists in vehicle recovery.

SLIDE 15:

   b. Gunner:
      (1) Disconnects headset.
      (2) Releases Gunners Restraint System/Product Improved Gunner's Restraint System
      (3) Orients self on the nearest door.
      (4) Unlocks combat door locks.
      (5) Opens door; if it does not open, tries a different door.
      (6) Exits with weapon.

(7) Assists crew to exit.
(8) Establishes security.
(9) Checks for fires.
(10) Activates fire extinguisher, as needed.
(11) Recovers sensitive items.
(12) Provides first aid.
(13) Assists in vehicle recovery.

SLIDE 16:

2. **If vehicle rolls onto side**

a. Lower level Soldiers, if able:
(1) Unbuckle seat belts.
(2) Assist upper Soldiers to unfasten seat belts then carefully lower.
b. Crew, if doors are jammed:
(1) Exit through hatch or cargo area if possible.
(2) Work as a team to open jammed doors.

NOTE: Conduct a check on learning and summarize the learning activity.

2. Learning Step / Activity 2. Identify actions to take after a Vehicle Rollover (in water)

Method of Instruction:	Conference / Discussion
Instructor to Student Ratio:	2:15
Time of Instruction:	10 mins
Media:	Large Group Instruction

SLIDE 17:

1. **After rollover (in water)**
a. All crewmembers:
(1) Turn off motor (driver).
(2) Disconnect headsets.
(3) Unbuckle seatbelt with one hand and immediately put both hands on ceiling.
(4) Unlock combat door locks if not already unlocked.
(5) Decide whether or not to remove personal equipment.
(6) Exit the vehicle.
(7) Assist each other to exit and secure weapons.
(8) Assess injuries.
(9) Get to safest shore.
(10) Provide security.
(11) Account for other crewmembers.
(12) Provide/seek first aid.
(13) Retrieve weapons, ammunition, and sensitive items.
(14) Assist with vehicle recovery.

b. VC:
(1) Accounts for weapons, ammunition, and sensitive items
(2) Requests medical support, if required.

(3) Reports accident.

SLIDE 18:

2. **Water rescue recovery drill**

In the event one or more crewmembers do not personally egress from the overturned vehicle:

a. Rescuers secure the accident site.
b. Stay in contact with the vehicle, hold onto the vehicle, and kick/swim to a high point in buddy teams.
c. Rescuers tie a rope/cable to the vehicle to aid rescue.
d. Open doors and hatches, using the emergency rescue wrench if necessary.
e. If doors and hatches are not accessible, rescuers must immediately use all available means to turn vehicle on its side to gain access to the turret.
f. Seek out the highest point on the vehicle from which to rescue trapped occupants.
g. Ensure all survivors have air and are able to breathe.
h. Check for other injuries and apply first aid.
i. Remove personal equipment, including body armor.
j. Carefully move injured personnel to the highest point on the vehicle.
k. Evacuate from vehicle high point to safest location, depending on:
(1) Enemy situation
(2) Water level and flow
(3) Water temperature
(4) Distance to water's edge
(5) Anticipation of rescue

NOTE: Conduct a check on learning and summarize the learning activity.

CHECK ON LEARNING: Conduct a check on learning and summarize the ELO.
SHOW SLIDE 19: CHECK ON LEARNING

1. A combat patrol loaded M1114, with a normal center of gravity (cg) and normal load can operate on slopes of up to:
a. 20 degrees.
b. 25 degrees.
c. 30 degrees.
d. 98.6 degrees.

2. The critical (rollover) angle for an in theatre up-armored HMMWV is:
a. 20 degrees.
b. 25 degrees.
c. 30 degrees.
d. 98.6 degrees.

3. The corrective action before reaching the critical rollover angle is:
a. Jerk the wheel back to the center of the road.
b. All occupants yell, “Water!”
c. Reduce speed and ease the vehicle back onto the roadway at a safe speed.
d. Secure the coolers and secure voice radios.

4. During egress, you find the door you're attempting to exit won't open. You should:
a. Inflate your water wings, kick out the windshield, and swim away from the enemy.
b. Don't panic - find a door that works.
c. Stay put and call the Auto club.
d. Stay put and call QRF on the secure voice radio.

SHOW SLIDE 20:

5. What are the egress actions for the Gunner following a rollover on dry land?
a. Disconnect headset, release gunner's restraint system, assess injuries, clear and check weapon, exit vehicle with weapon.
b. Assist crew to exit, establish security, recover sensitive items, provide first aid and assist in vehicle recovery.
c. a and b above.
d. Leap from the vehicle before it rolls.

6. What are the immediate actions of the Driver should an entry into the water be imminent?
a. Release the accelerator; yell *"Water!"* and keep hands on the steering wheel.
b. Tuck head and chin into chest and brace for impact; and steer vehicle to control entry into the water to prevent rollover.
c. a and b above.
d. Leap from the vehicle before it hits the water.

7. Prior to releasing your seatbelt for egress, and immediately afterward, you must:
a. Brace with one hand against what was the ceiling (consider which hand you should brace with) – your neck cannot support your body weight during a fall; unfasten your seatbelt with the other hand.
b. Unfasten your seatbelt with one hand, pushing firmly until it pops loose. You may have to push against the floor with your bracing hand to allow the seatbelt to unfasten.
c. a and b above.
d. Take out your k-bar and cut the thing off.

SHOW SLIDE 21:

8. What is the purpose of the combat door lock?
a. To prevent aggressors from entering the vehicle in a hostile area.
b. It interfaces with the Lojack circuitry, and assists police in recovery of a stolen HMMWV.
c. It jettisons the door if moisture is detected during a water entry.
d. There is no difference between a combat door lock and a conventional door lock.

9. When operating near bodies of water or crossing bridges, the HMMWV crew should:
a. Inform crewmembers of the water hazard, loosen seatbelts, and slow down.
b. Identify water hazards, unlock combat locks, remove seatbelts, and slow down.
c. Slow down, inform crewmembers of possible water hazards, unlock combat door locks (enemy situation permitting).
d. Look for alternate routes.

10. To reduce the risk of being involved in a rollover, HMMWV crews should:
a. Check tires for proper inflation and serviceability, and slow down.
b. Slow down, don't overload the vehicle, check condition and serviceability of tires, and secure loads.
c. Ensure operators are properly licensed.
d. Limit crews operating in the vehicle to four or less.

SHOW SLIDE 22:

11. What can gunners do to minimize their injuries when involved in a rollover?
a. Try to jump away from the vehicle.
b. Lower themselves and brace for impact.
c. Yell *"Rollover!"* while lowering themselves into the vehicle, bracing for impact.
d. Call the Automobile Club and complain about that last sharp curve in the road.

12. What preventive measures can be taken to minimize the chances of being involved in a rollover?
a. Make a detailed Power Point presentation of any sharp curve in the road for emailing to your Congressman in a formal yet anonymous complaint.
b. License and certify all crews on the HEAT, and train as a team.
c. Slow down, avoid panic, know proper vehicle maneuvering, use caution in rural areas with soft shoulders, and identify water hazards.
d. Only tracking your number of days left in country will help.

13. Other than the driver and gunner, what are the duties of the crew in the event of a rollover?
a. Yell *"Rollover!"*
b. Grab the gunner and pull him/her into the crew compartment.
c. Brace for impact.
d. All of the above.

SLIDE:23

C. ENABLING LEARNING OBJECTIVE

ACTION:	HEAT operator performance drill familiarization
CONDITIONS:	In the HEAT trainer with required equipment and previous training.
STANDARDS:	Properly evacuate the HEAT while adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.

1. Learning Step / Activity 1. Review rollover and escape actions/observe HEAT

Method of Instruction: Conference/Demonstration
Instructor to Student Ratio: 2:5
Time of Instruction: 25 mins
Media: Small Group Instruction (SGI)

SLIDE 24:

Show HEAT Gunner restraint system Video and demonstrate/review restraint system (CLICK BOX TO BEGIN MOVIE)

Observation.

1. Move group to the HEAT device room, and observe the previous group undergoing training in the device. After the group in the HEAT completes their cycle, move the observation group into the device to perform PE.

2. Group is in device with restraints fastened and doors locked. Conduct review/walk thru of below Drill/actions to take during and immediately following rollover and escaping from the HMMWV.

3. Communicate with the driver – tell the driver what is to the left, right, rear and overhead. Your gunner is your eyes and ears. The gunner may be the only crewmember capable of seeing around the entire vehicle. Use the vehicle intercom system to pass visual information to the driver, but rehearse shouted voice commands and hand signals in case the intercom is inoperative. Avoid hazards; use a ground guide whenever practicable. The gunner must remain in *nametag defilade* IAW FM 21-305 (Manual for the Wheeled Vehicle Driver), TC 21-305 (Training Program for Wheeled Vehicle Accident Avoidance), TC 21-305-4 (Training Program for the High Mobility Multipurpose Wheeled Vehicle), and TC 21-306 (Tracked Combat Vehicle Driver Training).

Note: Of all the vehicle occupants, the likelihood of injury to the gunner is disproportionately higher than those of the others. Knowing the fundamental purpose of the HEAT, those occupying the gunner position must exercise particular diligence in securing occupant restraints, bracing for the rollover, and be particularly mindful of the increased potential for head and neck injuries – even in the device. Further, those occupying the gunner position in the HEAT must verify prior to each rollover iteration that the gunner hatch locking mechanism remains secure, and to avoid inadvertent disengagement of the lock during each rollover.

4. Wear seatbelts. Survive the rollover!

5. **During the roll**:

(a) **The driver drives**. Continue to navigate the vehicle as long as the controls of the vehicle influence and direct its path and speed.

(b) **The gunner must slip out of the gunner's seat**, attempting to retract into the cab of the vehicle as quickly as possible sliding their feet towards the direction of the roll. While this action doesn't eliminate the bouncing around inside the vehicle, it substantially reduces the likelihood of decapitation, and puts the roll cage of the vehicle between the gunner and the accident site.

(c) **All others in the vehicle must make a grab for the gunner**, assisting him/her as abruptly as necessary to get into the cab of the vehicle as quickly as possible.

6. Use combat locks – safely. Combat locks help keep the doors closed in a crash, but are often a hazard near water. Unlock combat door locks when near water (enemy situation permitting).

7. Know how to get out. Rehearse vehicle evacuation as if only one exit is available. **Actual egress entails**:

(a) **BRACE** with one hand against the floor (what *was* the ceiling).

(i) Consider which hand you should brace with (figure which hand can reach your seatbelt, and use the other one to brace).

(ii) Do not unlatch your seatbelt without bracing on the floor – your neck cannot support your body weight, let alone all the *battle rattle* you have on.

(b) **UNFASTEN** your seatbelt with your other hand.
(i) Push against the floor with your bracing hand to release the tension on the seatbelt so it will unfasten.
(ii) Find the release button and press it firmly until it pops loose.
(iii) Be prepared to fall when the belt unlatches. Tuck your head, and protect your neck at all costs.

(c) **SLIDE** out of your seat, being sure to **disconnect your headset**.
(i) Remember that you cannot open the door while inverted.
(ii) Be aware of your buddies and don't kick them in the face.
(iii) Muzzle awareness at all times.
(iv) Be aware your gear may get caught on something.

(d) **ORIENT** yourself on the door.
(i) Dropping out of your seat is more disorienting than expected.
(ii) Get yourself right side up before worrying about the door.
(iii) Look at the door – consider how it will open now that it is inverted.

(e) **UNLOCK AND OPEN** the door. If it doesn't open, find a door that works. Recall whether your vehicle is one with two-stage combat locks or one-stage, and the differences it takes to open each.
(i) Armored doors weigh in excess of 240 pounds each, and are not meant to be inverted.
(ii) The door may be difficult or impossible to open.
(iii) Once the latch is open, you will have to really lean into the door to get it open. However, if your door is not opening, try another door!
(iv) When you open a door, shout "Open door *(and the location)*!"

(f) **GET OUT**, but don't let your buddy down.
(i) Determine if all crewmembers are aware of the open door, and whether they are moving toward it.
(ii) Determine if all crewmembers are conscious.
(iii) Consider the risks of moving injured soldiers – don't make the situation worse, but you can't leave them hanging upside down, or there to drown.
(iv) Look before you leap – don't rush out the first door, only to fall off a cliff, or thrust yourself into a burning fuel or oil slick.

8. The **Gunner's egress** entails some specific and additional steps:
(a) Slide feet to the direction of roll, as the torso and legs are withdrawn to present the lowest possible profile.
(b) Depending on how the rear seats are occupied:
(i) When both rear seats are occupied, both rear seat occupants will maintain a firm grasp on the gunner, pulling the gunner down inside the vehicle through the turret – assisting in restraining the gunner throughout the rollover until the vehicle has come to a stop.
(ii) If only one rear seat is occupied, the back seat occupant will pull the Gunner toward them, much as described above.
(c) Releases Gunners Restraint System/Product Improved Gunner's Restraint System and egress.

NOTE: Conduct a check on learning and summarize the learning activity.

2. Learning Step / Activity 2. HEAT PE 1

Method of Instruction: Practical Exercise (Performance)
Instructor to Student Ratio: 2:5
Time of Instruction: 1 hr
Media: Small Group Instruction (SGI)

Conduct PE as outlined

NOTE: Conduct a check on learning and summarize the learning activity.

CHECK ON LEARNING: Conduct a check on learning and summarize the ELO.

SECTION IV. SUMMARY

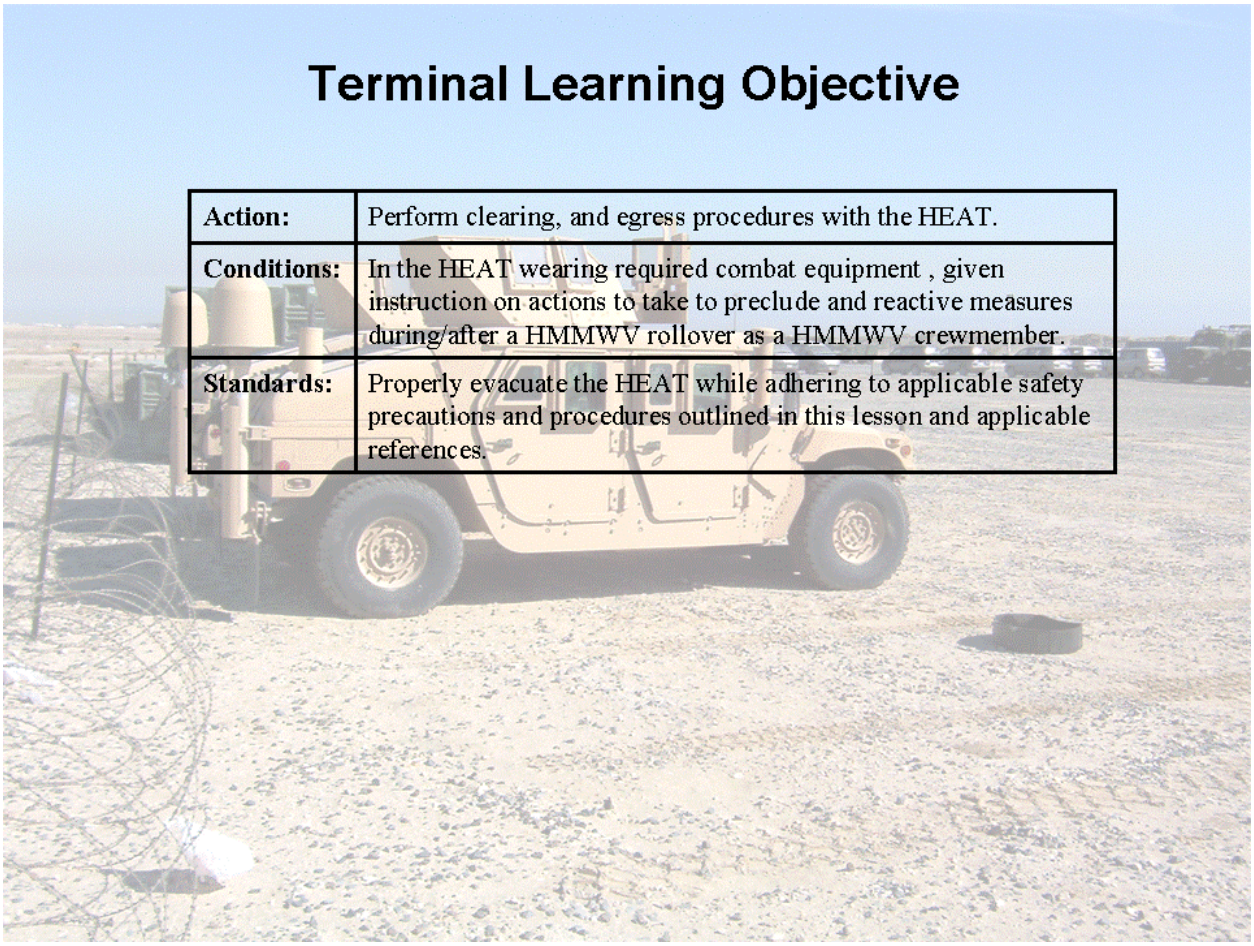
Method of Instruction: Conference / Discussion
Instructor to Student Ratio is: 1:15
Time of Instruction: 5 mins
Media: Large Group Instruction

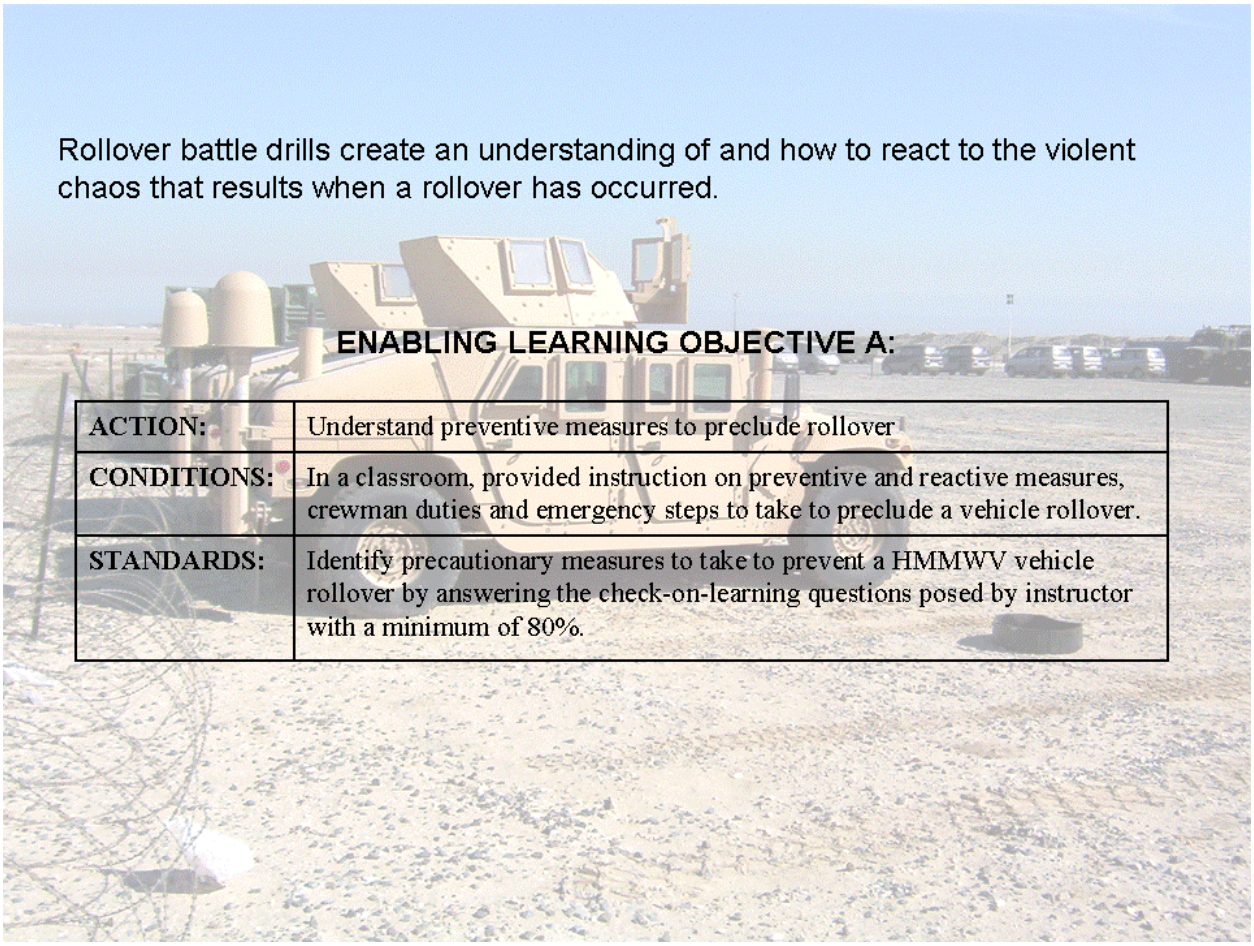
Check on Learning	Determine if the students have learned the material presented by soliciting student questions and explanations. Ask the students questions and correct misunderstandings.
Review / Summarize Lesson	As each group completes the PE, move them to the debrief area, and look for signs of motion sickness. Give final thoughts to reinforce the training they have received, and ask for suggestions to improve the training.

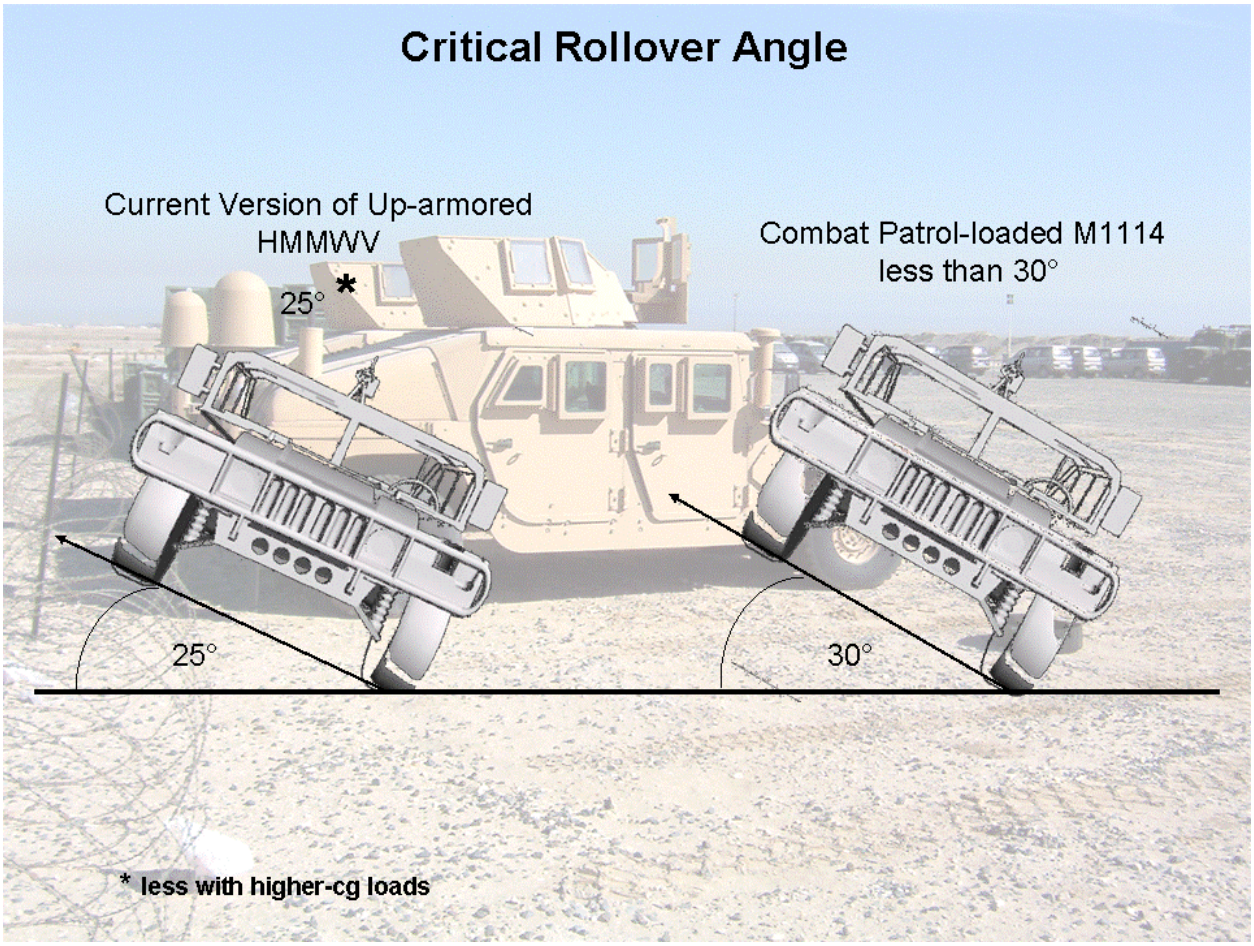
SECTION V. STUDENT EVALUATION

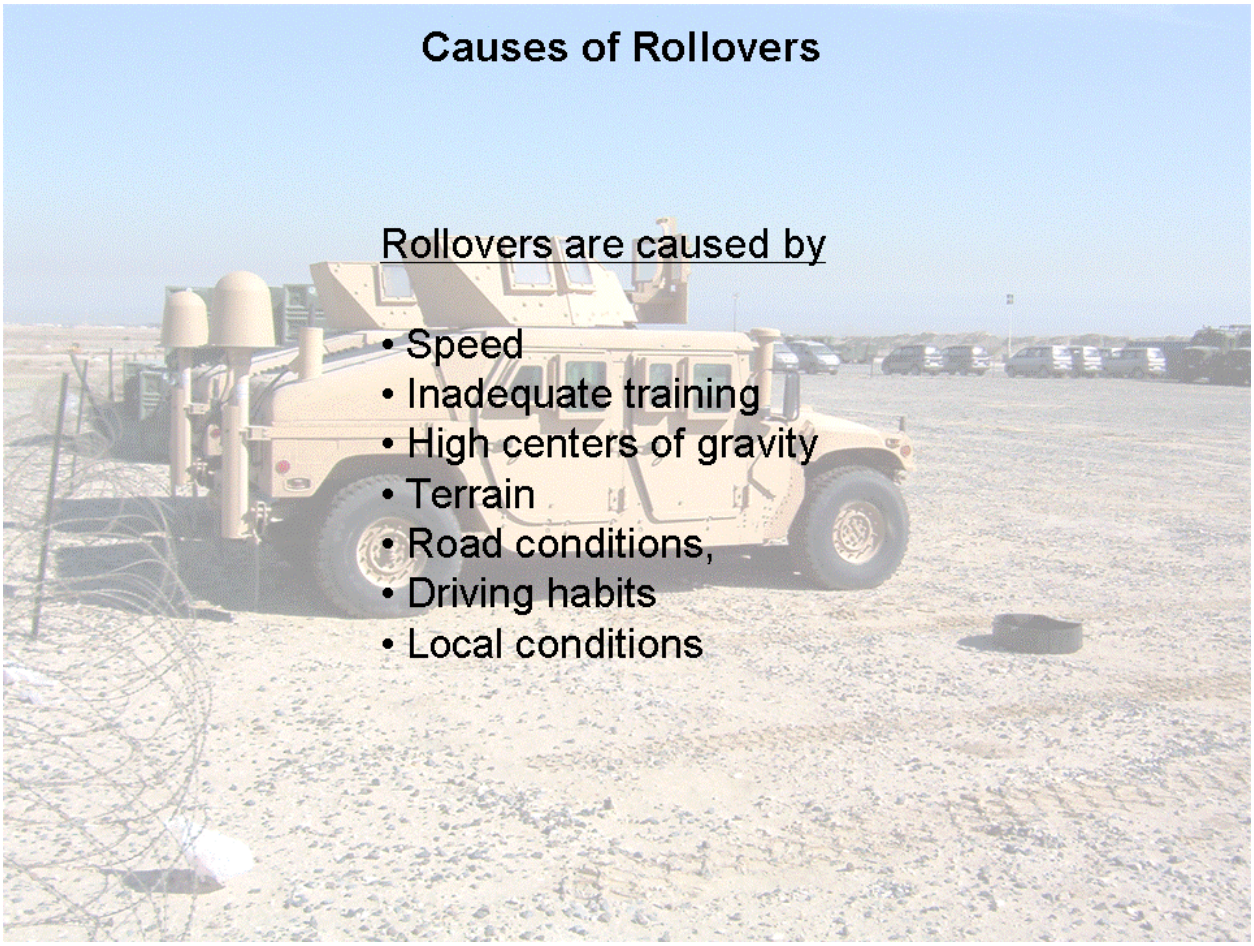
Testing Requirements	**NOTE:** Describe how the student must demonstrate accomplishment of the TLO. Refer student to the Student Evaluation Plan.
Feedback Requirements	**NOTE:** Feedback is essential to effective learning. Schedule and provide feedback on the evaluation and any information to help answer students' questions about the test. Provide remedial training as needed.


High Mobility Multipurpose Wheeled Vehicle (HMMWV)
Egress Assistance Trainer

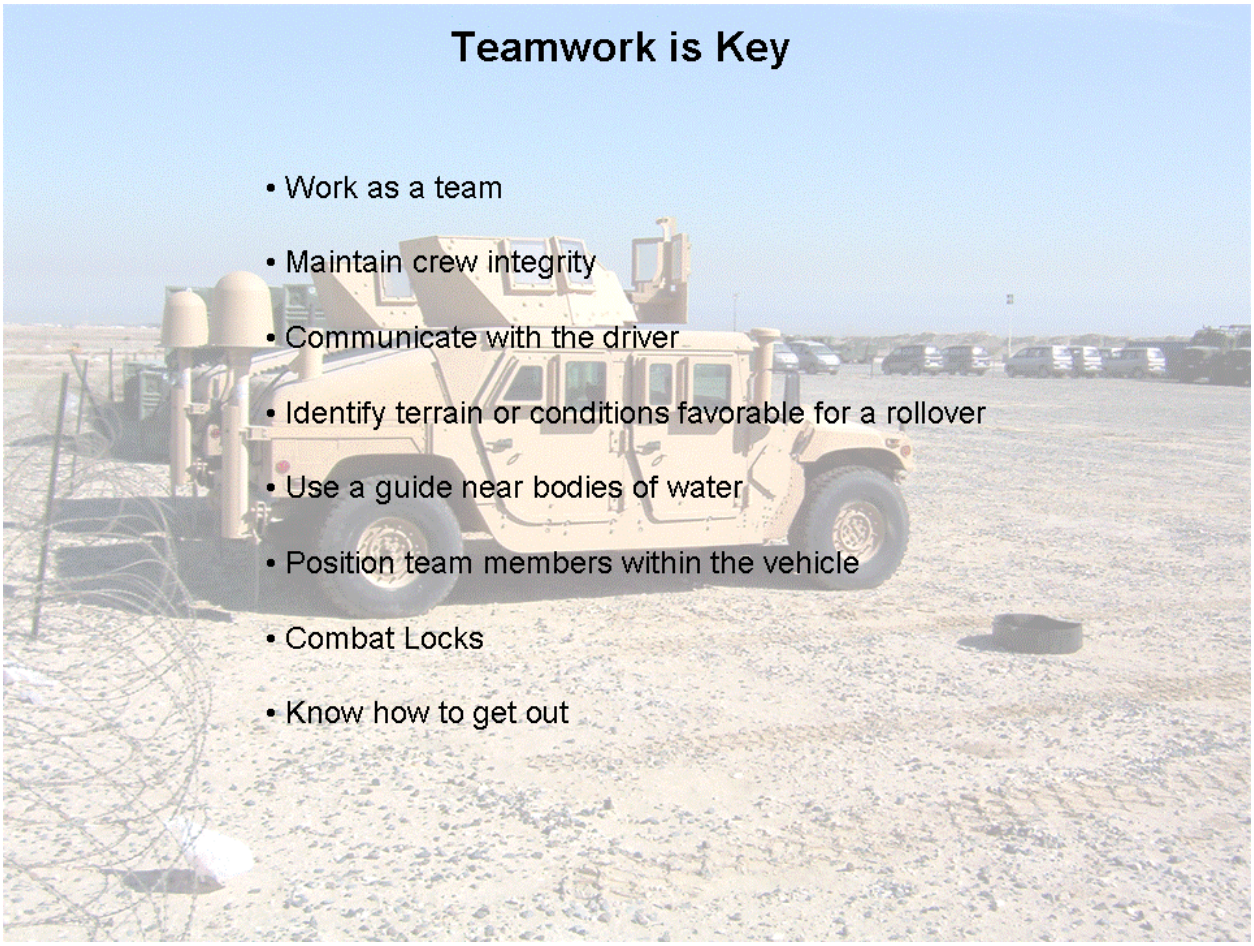

Terminal Learning Objective
Action:
Perform clearing, and egress procedures with the HEAT.
Conditions:
In the HEAT wearing required combat equipment , given instruction on actions to take to preclude and reactive measures during/after a HMMWV rollover as a HMMWV crewmember.
Standards:
Properly evacuate the HEAT while adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.


Rollover battle drills create an understanding of and how to react to the violent chaos that results when a rollover has occurred.
ENABLING LEARNING OBJECTIVE A:
ACTION: Understand preventive measures to preclude rollover
CONDITIONS: In a classroom, provided instruction on preventive and reactive measures, crewman duties and emergency steps to take to preclude a vehicle rollover.
STANDARDS: Identify precautionary measures to take to prevent a HMMWV vehicle rollover by answering the check-on-learning questions posed by instructor with a minimum of 80%.


Critical Rollover Angle
Current Version of Up-armored HMMWV
25° *
Combat Patrol-loaded M1114 less than 30°
25°
30°
* less with higher-cg loads

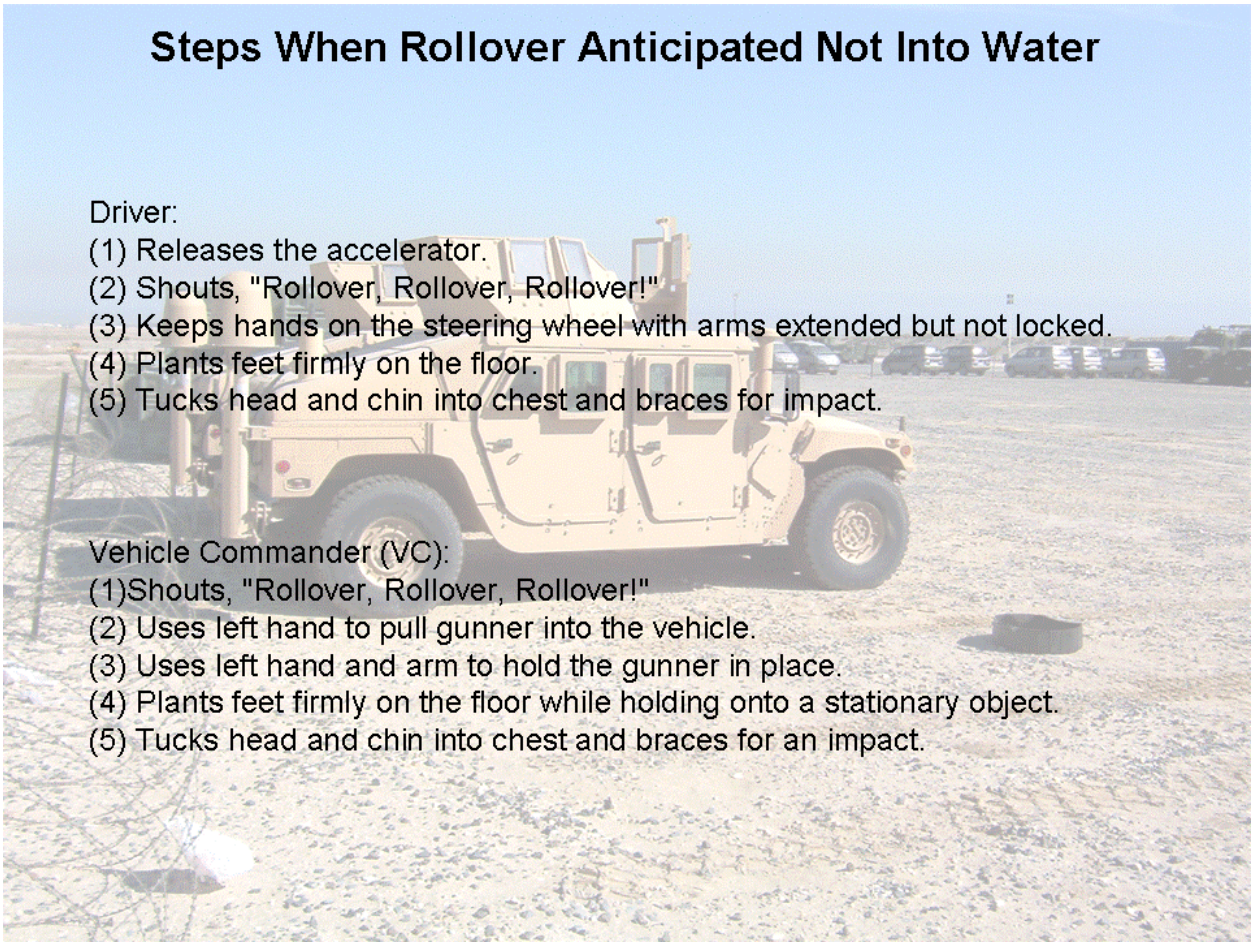

Causes of Rollovers
Rollovers are caused by
• Speed
• Inadequate training
• High centers of gravity
• Terrain
• Road conditions,
• Driving habits
• Local conditions

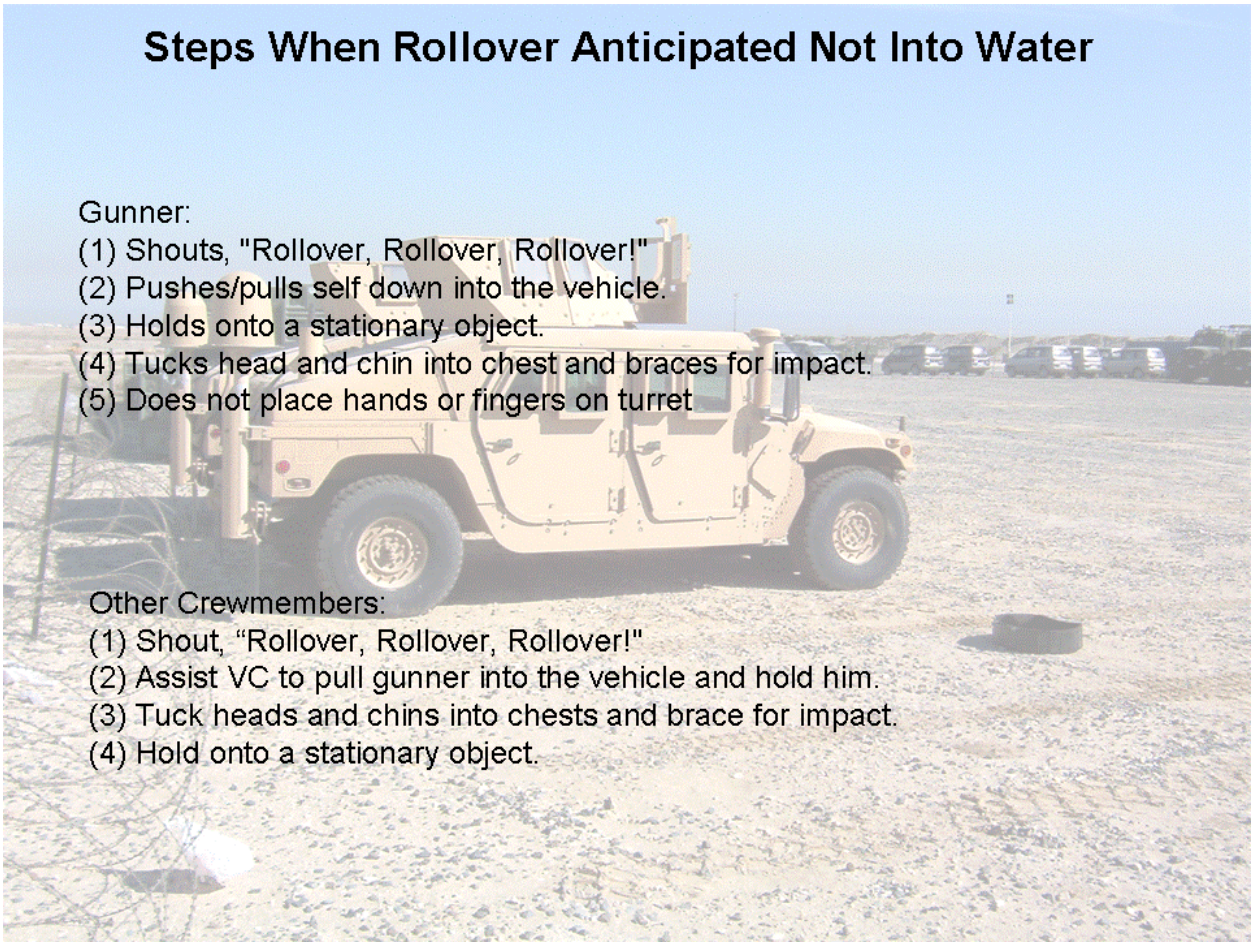

Driver Risk Management Control Measures
• Adjust the vehicle speed
• Slow down
• Avoid panic
• Observe speed limit
• Do not rely on a "seat of the pants"
• Slowly accelerate
• Maintain a "space cushion"
• Avoid the temptation to brake hard

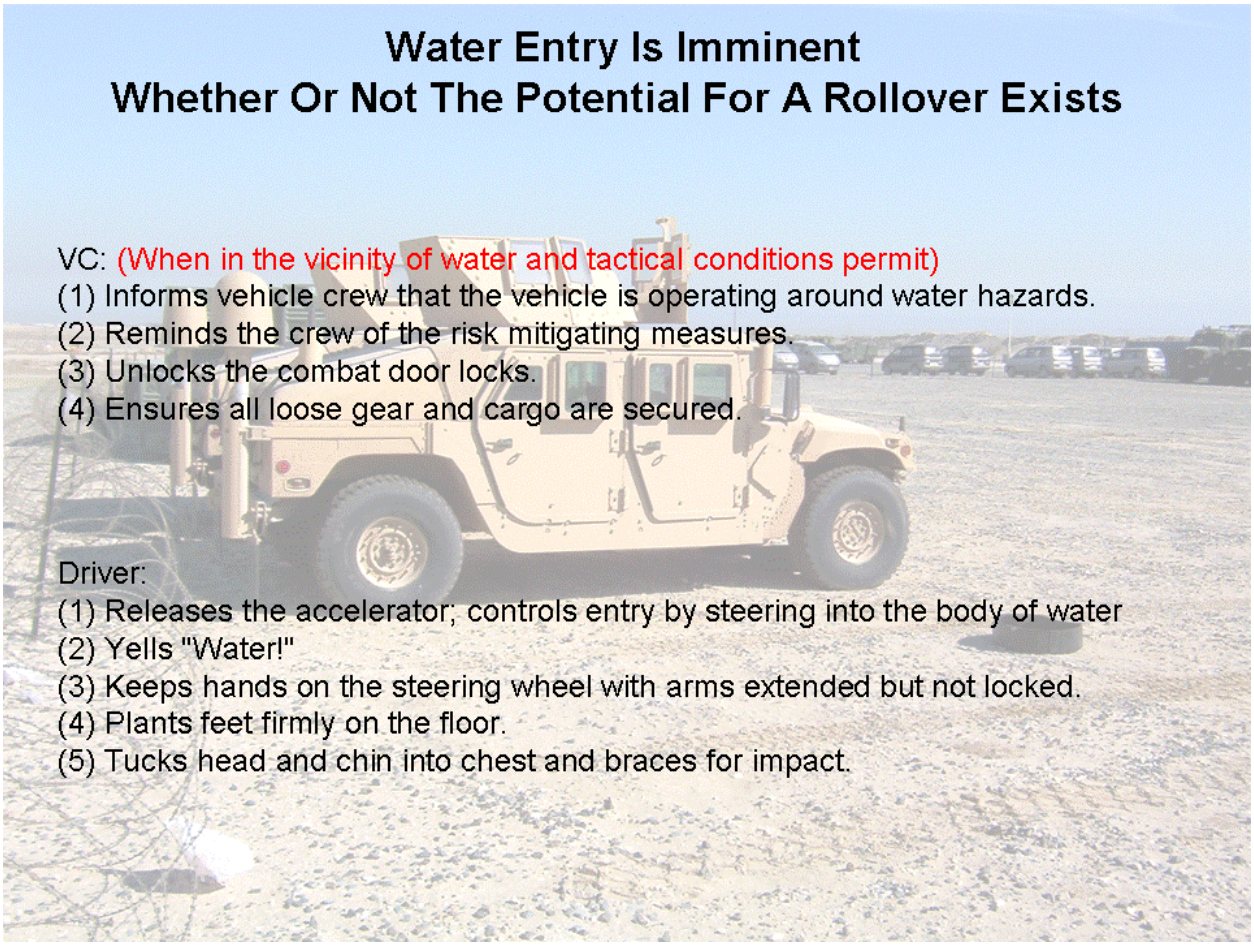

Teamwork is Key
• Work as a team
• Maintain crew integrity
• Communicate with the driver
• Identify terrain or conditions favorable for a rollover
• Use a guide near bodies of water
• Position team members within the vehicle
• Combat Locks
• Know how to get out

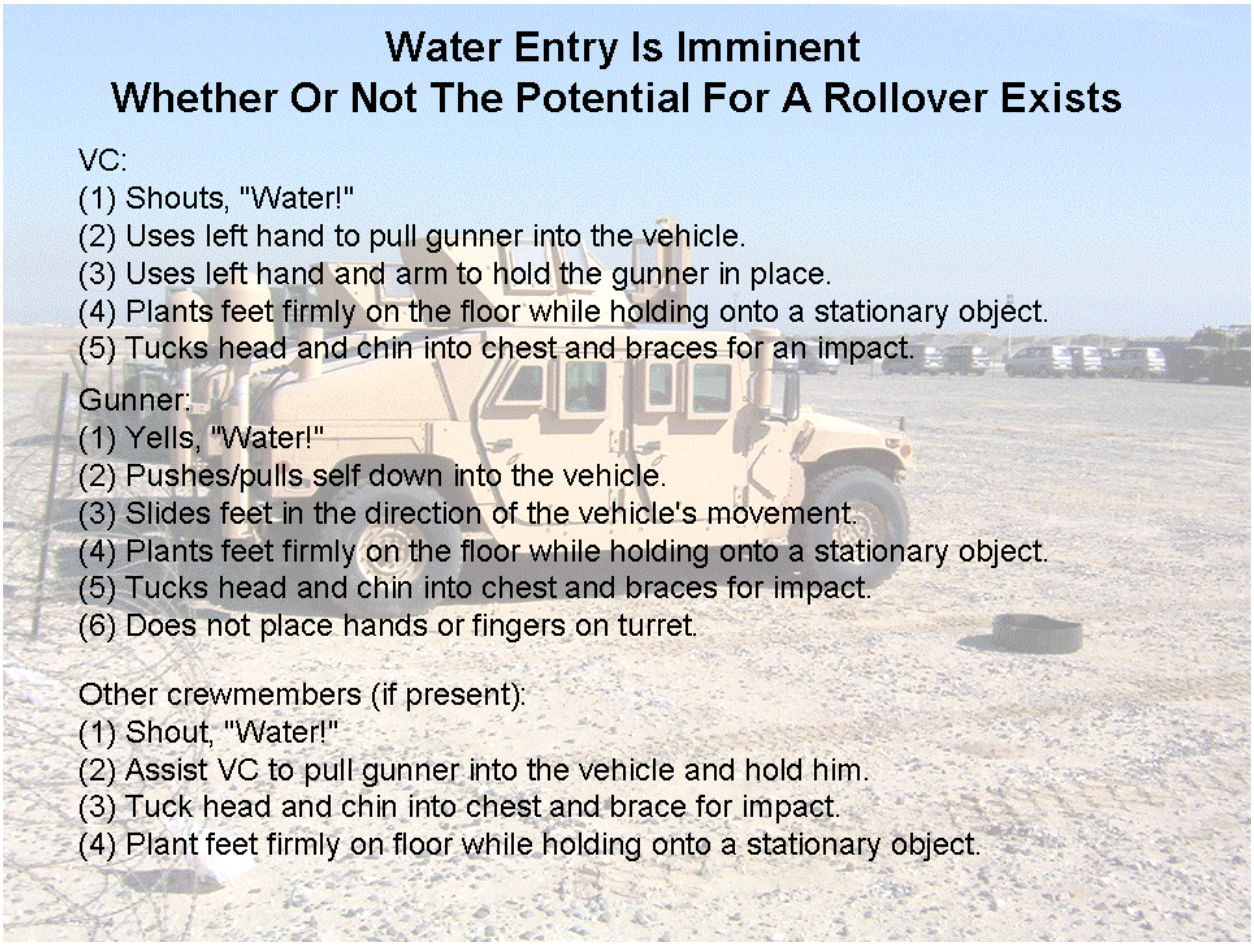
Price of Uparmored HMMWVs

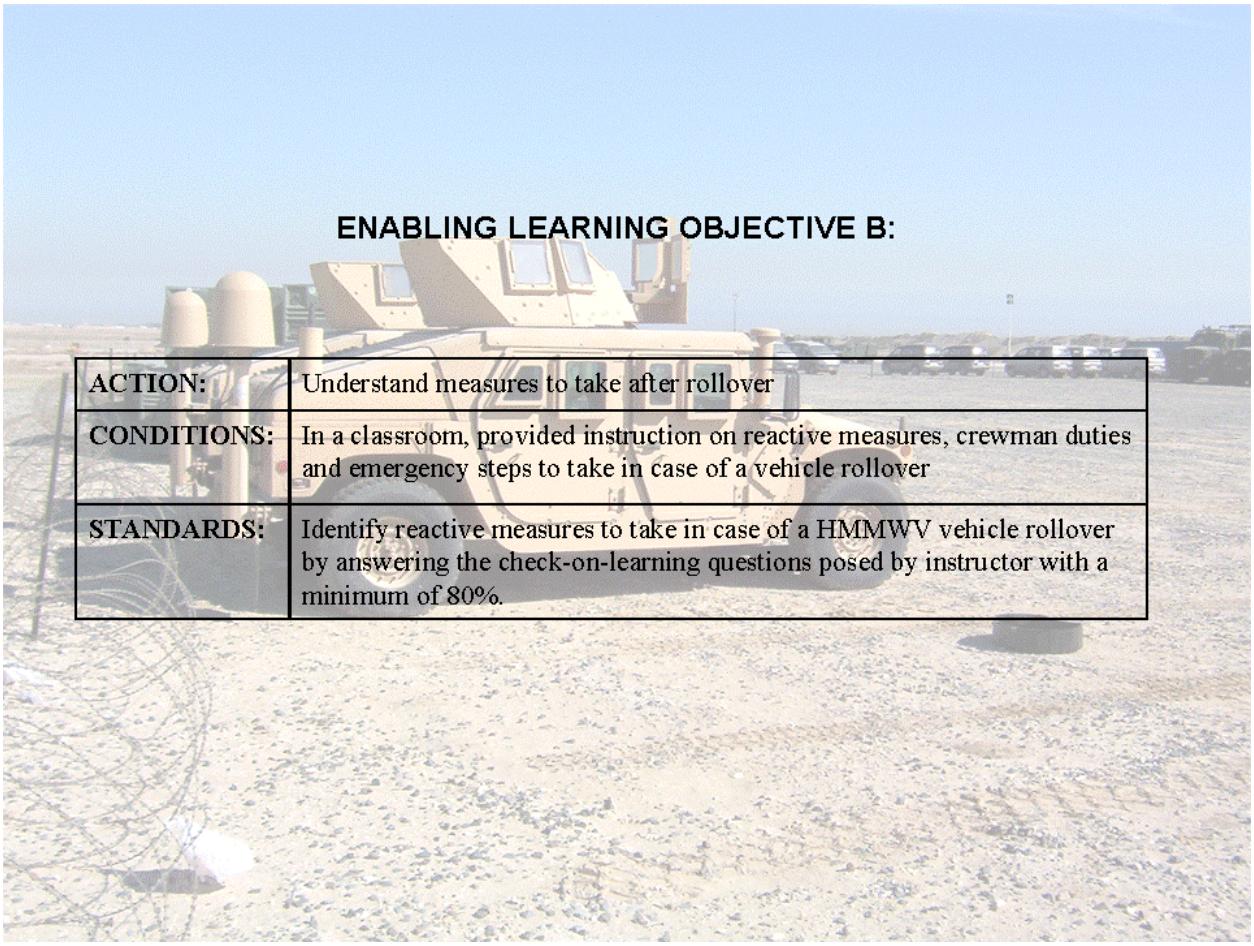
- Extremely-top heavy
- Vehicle rollovers common and deadly occurrence


Steps When Rollover Anticipated Not Into Water
Driver:
(1) Releases the accelerator.
(2) Shouts, "Rollover, Rollover, Rollover!"
(3) Keeps hands on the steering wheel with arms extended but not locked.
(4) Plants feet firmly on the floor.
(5) Tucks head and chin into chest and braces for impact.
Vehicle Commander (VC):
(1)Shouts, "Rollover, Rollover, Rollover!"
(2) Uses left hand to pull gunner into the vehicle.
(3) Uses left hand and arm to hold the gunner in place.
(4) Plants feet firmly on the floor while holding onto a stationary object.
(5) Tucks head and chin into chest and braces for an impact.


Steps When Rollover Anticipated Not Into Water
Gunner:
(1) Shouts, "Rollover, Rollover, Rollover!"
(2) Pushes/pulls self down into the vehicle.
(3) Holds onto a stationary object.
(4) Tucks head and chin into chest and braces for impact.
(5) Does not place hands or fingers on turret
Other Crewmembers:
(1) Shout, “Rollover, Rollover, Rollover!"
(2) Assist VC to pull gunner into the vehicle and hold him.
(3) Tuck heads and chins into chests and brace for impact.
(4) Hold onto a stationary object.

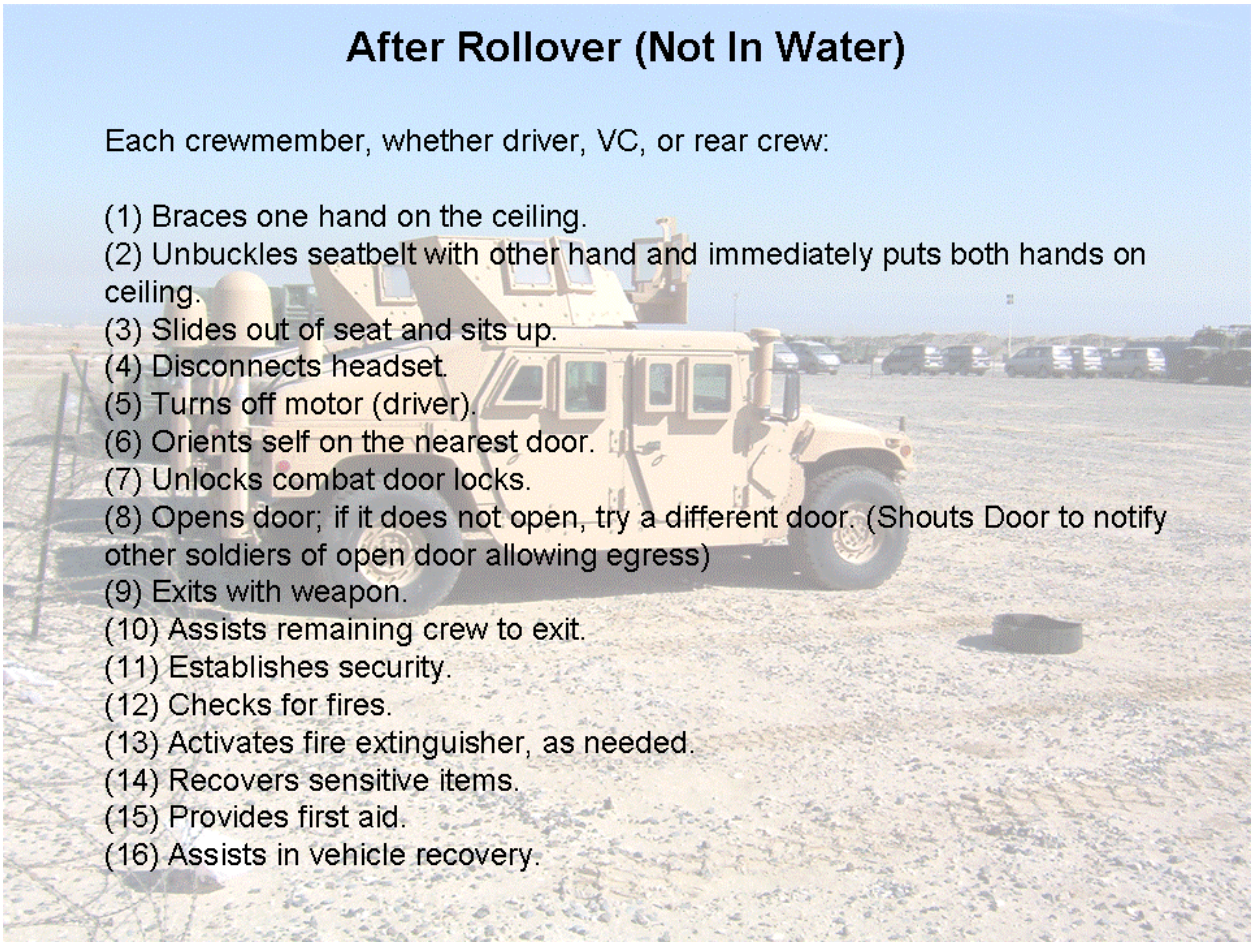

Water Entry Is Imminent
Whether Or Not The Potential For A Rollover Exists
VC: (When in the vicinity of water and tactical conditions permit)
(1) Informs vehicle crew that the vehicle is operating around water hazards.
(2) Reminds the crew of the risk mitigating measures.
(3) Unlocks the combat door locks.
(4) Ensures all loose gear and cargo are secured.
Driver:
(1) Releases the accelerator; controls entry by steering into the body of water
(2) Yells "Water!"
(3) Keeps hands on the steering wheel with arms extended but not locked.
(4) Plants feet firmly on the floor.
(5) Tucks head and chin into chest and braces for impact.


Water Entry Is Imminent
Whether Or Not The Potential For A Rollover Exists
VC:
(1) Shouts, "Water!"
(2) Uses left hand to pull gunner into the vehicle.
(3) Uses left hand and arm to hold the gunner in place.
(4) Plants feet firmly on the floor while holding onto a stationary object.
(5) Tucks head and chin into chest and braces for an impact.
Gunner:
(1) Yells, "Water!"
(2) Pushes/pulls self down into the vehicle.
(3) Slides feet in the direction of the vehicle's movement.
(4) Plants feet firmly on the floor while holding onto a stationary object.
(5) Tucks head and chin into chest and braces for impact.
(6) Does not place hands or fingers on turret.
Other crewmembers (if present):
(1) Shout, "Water!"
(2) Assist VC to pull gunner into the vehicle and hold him.
(3) Tuck head and chin into chest and brace for impact.
(4) Plant feet firmly on floor while holding onto a stationary object.



ENABLING LEARNING OBJECTIVE B:

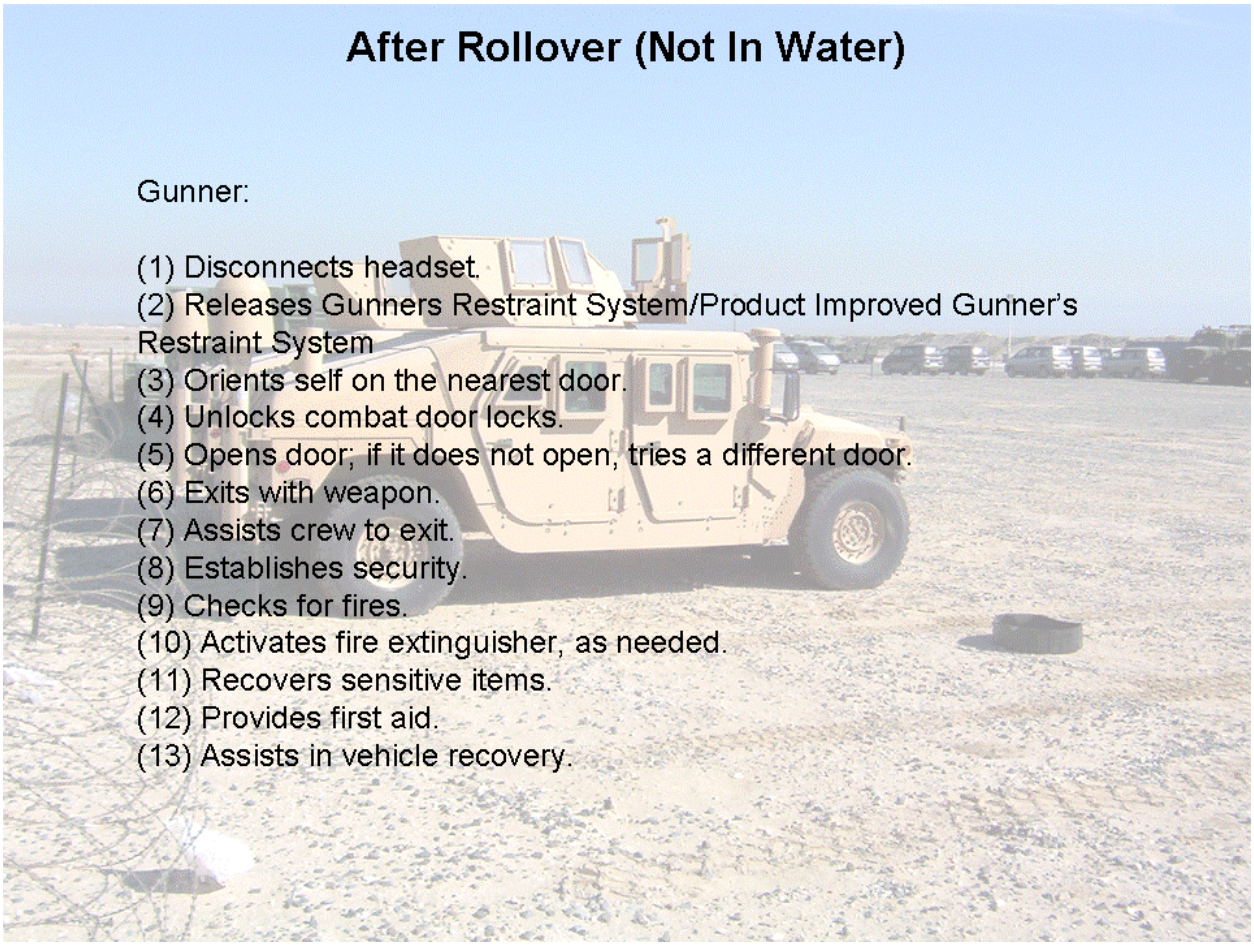
ACTION:	Understand measures to take after rollover
CONDITIONS:	In a classroom, provided instruction on reactive measures, crewman duties and emergency steps to take in case of a vehicle rollover
STANDARDS:	Identify reactive measures to take in case of a HMMWV vehicle rollover by answering the check-on-learning questions posed by instructor with a minimum of 80%.



After Rollover (Not In Water)

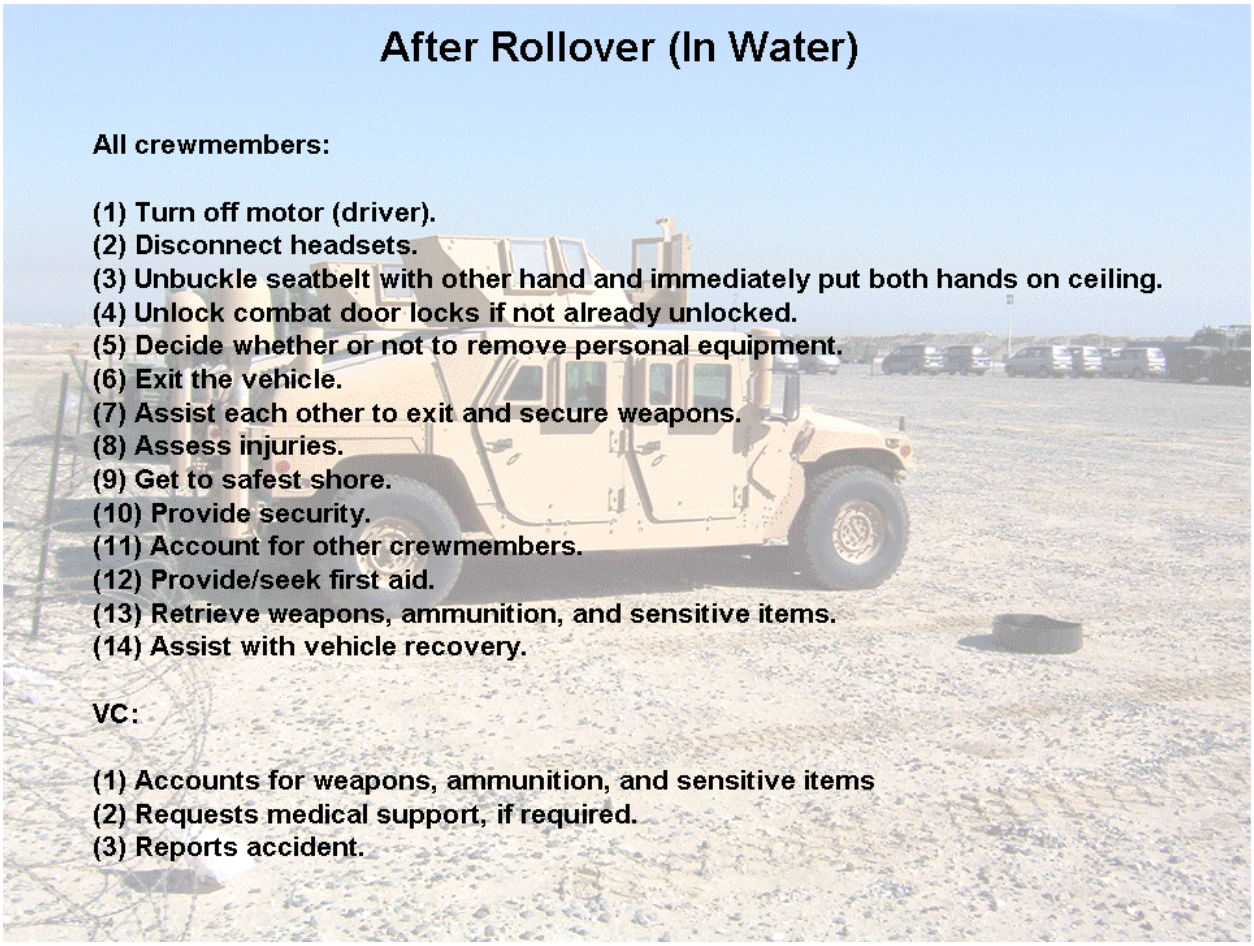
Each crewmember, whether driver, VC, or rear crew:

(1) Braces one hand on the ceiling.
(2) Unbuckles seatbelt with other hand and immediately puts both hands on ceiling.
(3) Slides out of seat and sits up.
(4) Disconnects headset.
(5) Turns off motor (driver).
(6) Orients self on the nearest door.
(7) Unlocks combat door locks.
(8) Opens door; if it does not open, try a different door. (Shouts Door to notify other soldiers of open door allowing egress)
(9) Exits with weapon.
(10) Assists remaining crew to exit.
(11) Establishes security.
(12) Checks for fires.
(13) Activates fire extinguisher, as needed.
(14) Recovers sensitive items.
(15) Provides first aid.
(16) Assists in vehicle recovery.


After Rollover (Not In Water)
Gunner:
(1) Disconnects headset.
(2) Releases Gunners Restraint System/Product Improved Gunner's Restraint System
(3) Orients self on the nearest door.
(4) Unlocks combat door locks.
(5) Opens door; if it does not open, tries a different door.
(6) Exits with weapon.
(7) Assists crew to exit.
(8) Establishes security.
(9) Checks for fires.
(10) Activates fire extinguisher, as needed.
(11) Recovers sensitive items.
(12) Provides first aid.
(13) Assists in vehicle recovery.


If Vehicle Rolls Onto Side
Lower level Soldiers, if able:
(1) Unbuckle seat belts.
(2) Assist upper Soldiers to unfasten seat belts then carefully lower.
Crew, if doors are jammed:
(1) Exit through hatch or cargo area if possible.
(2) Work as a team to open jammed doors.

After Rollover (In Water)

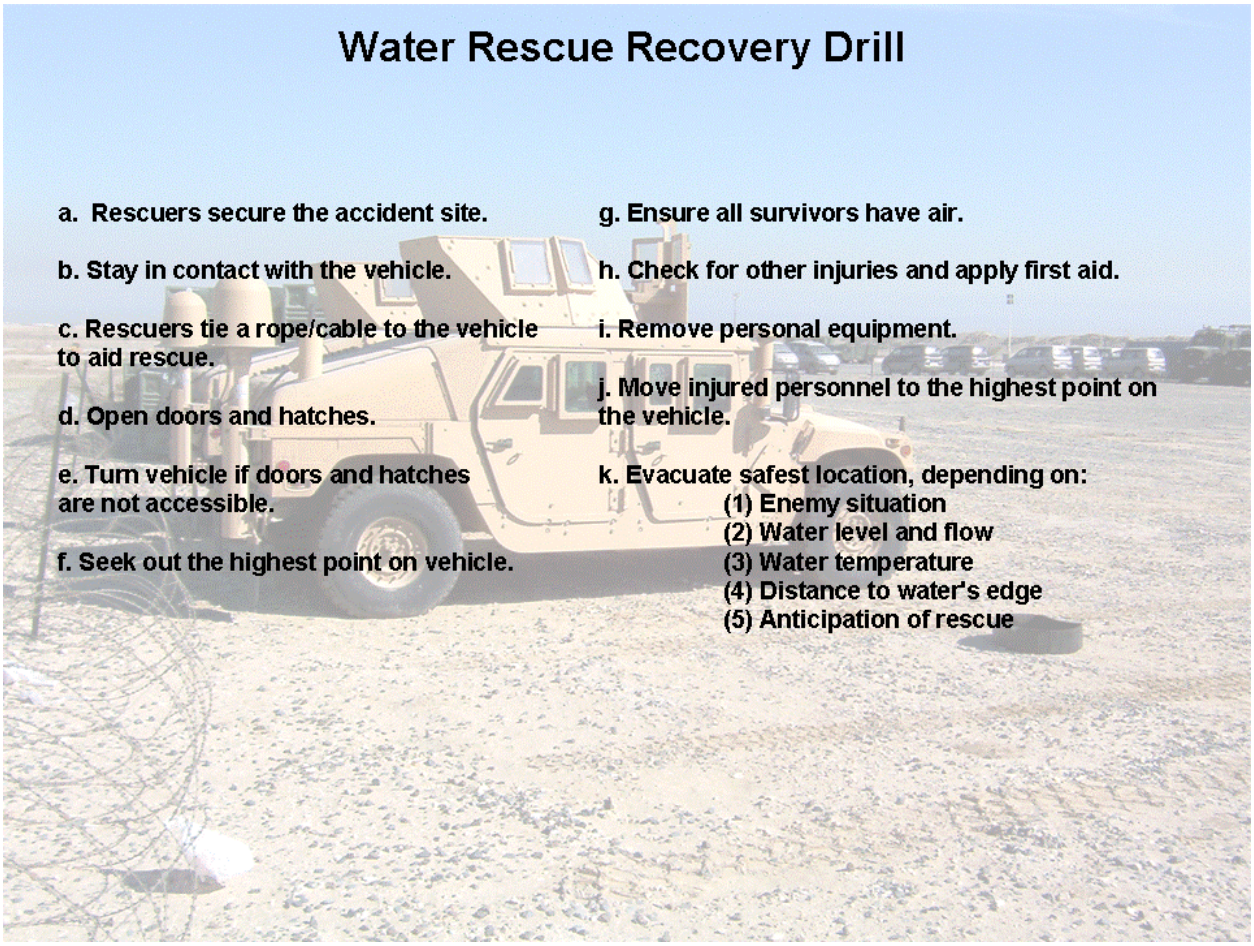


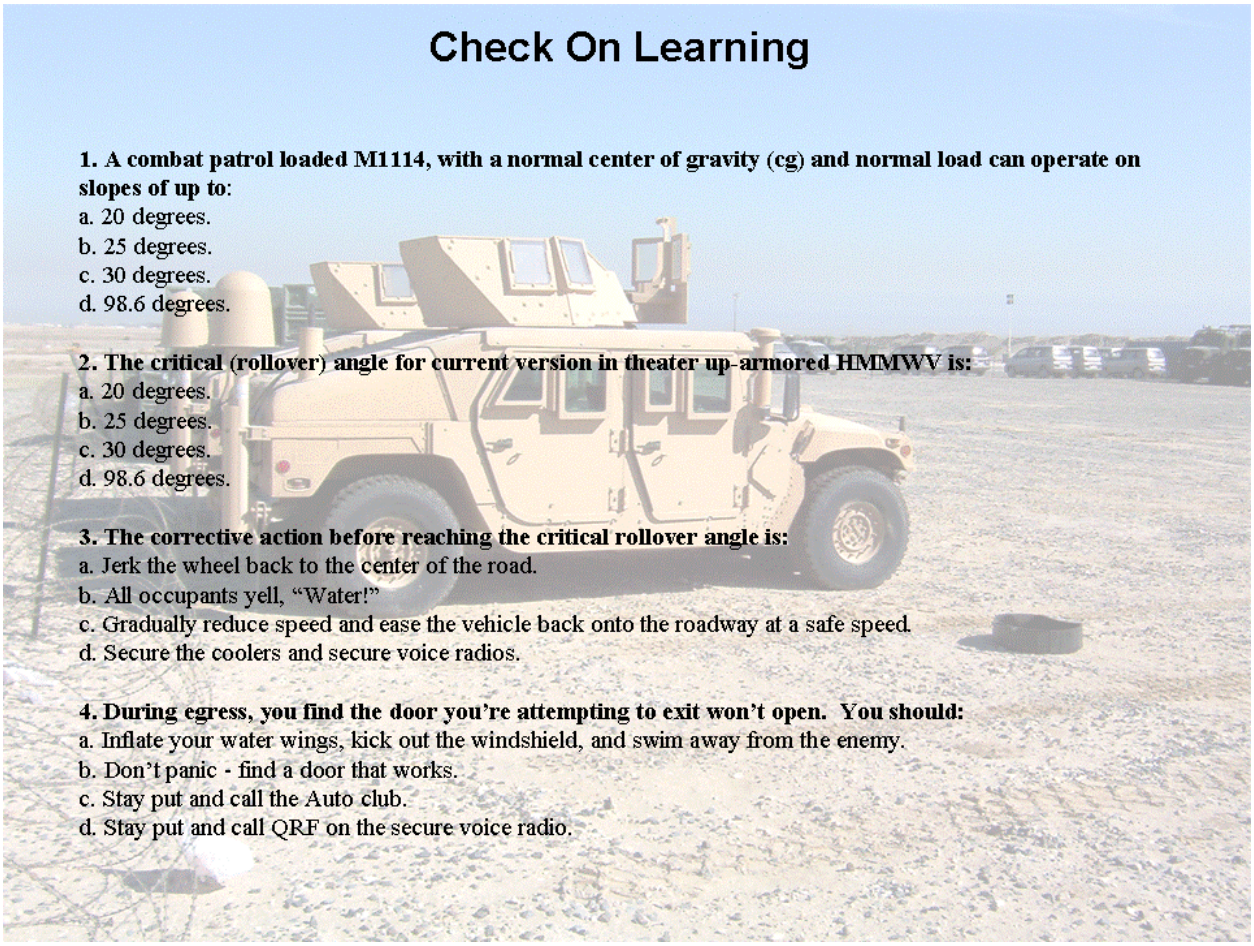
All crewmembers:

(1) Turn off motor (driver).
(2) Disconnect headsets.
(3) Unbuckle seatbelt with other hand and immediately put both hands on ceiling.
(4) Unlock combat door locks if not already unlocked.
(5) Decide whether or not to remove personal equipment.
(6) Exit the vehicle.
(7) Assist each other to exit and secure weapons.
(8) Assess injuries.
(9) Get to safest shore.
(10) Provide security.
(11) Account for other crewmembers.
(12) Provide/seek first aid.
(13) Retrieve weapons, ammunition, and sensitive items.
(14) Assist with vehicle recovery.

VC:

(1) Accounts for weapons, ammunition, and sensitive items
(2) Requests medical support, if required.
(3) Reports accident.


Water Rescue Recovery Drill
a. Rescuers secure the accident site.
b. Stay in contact with the vehicle.
c. Rescuers tie a rope/cable to the vehicle to aid rescue.
d. Open doors and hatches.
e. Turn vehicle if doors and hatches are not accessible.
f. Seek out the highest point on vehicle.
g. Ensure all survivors have air.
h. Check for other injuries and apply first aid.
i. Remove personal equipment.
j. Move injured personnel to the highest point on the vehicle.
k. Evacuate safest location, depending on:
(1) Enemy situation
(2) Water level and flow
(3) Water temperature
(4) Distance to water's edge
(5) Anticipation of rescue



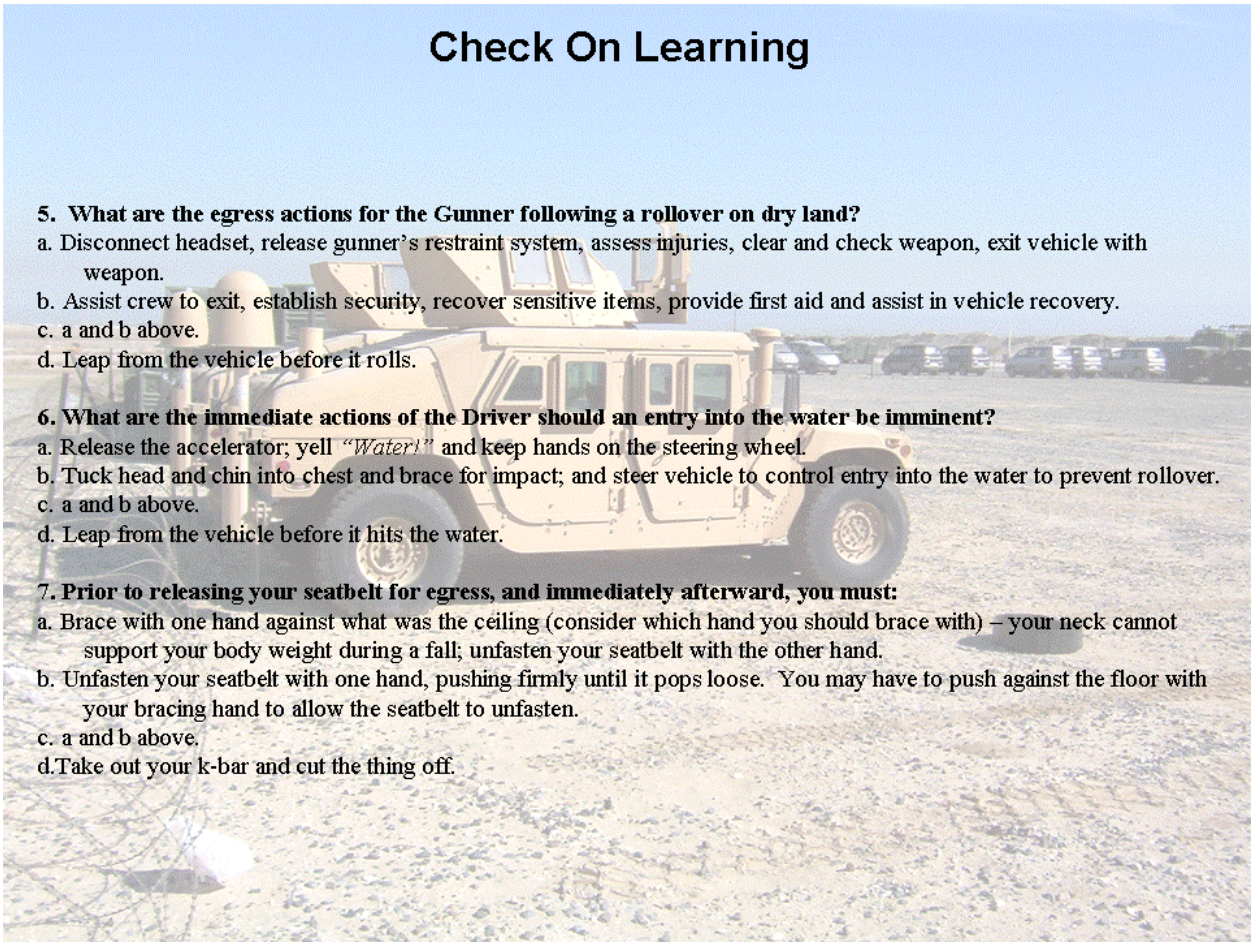
Check On Learning

1. A combat patrol loaded M1114, with a normal center of gravity (cg) and normal load can operate on slopes of up to:
a. 20 degrees.
b. 25 degrees.
c. 30 degrees.
d. 98.6 degrees.

2. The critical (rollover) angle for current version in theater up-armored HMMWV is:
a. 20 degrees.
b. 25 degrees.
c. 30 degrees.
d. 98.6 degrees.

3. The corrective action before reaching the critical rollover angle is:
a. Jerk the wheel back to the center of the road.
b. All occupants yell, "Water!"
c. Gradually reduce speed and ease the vehicle back onto the roadway at a safe speed.
d. Secure the coolers and secure voice radios.

4. During egress, you find the door you're attempting to exit won't open. You should:
a. Inflate your water wings, kick out the windshield, and swim away from the enemy.
b. Don't panic - find a door that works.
c. Stay put and call the Auto club.
d. Stay put and call QRF on the secure voice radio.



Check On Learning

5. What are the egress actions for the Gunner following a rollover on dry land?

a. Disconnect headset, release gunner's restraint system, assess injuries, clear and check weapon, exit vehicle with weapon.

b. Assist crew to exit, establish security, recover sensitive items, provide first aid and assist in vehicle recovery.

c. a and b above.

d. Leap from the vehicle before it rolls.

6. What are the immediate actions of the Driver should an entry into the water be imminent?

a. Release the accelerator; yell *"Water!"* and keep hands on the steering wheel.

b. Tuck head and chin into chest and brace for impact; and steer vehicle to control entry into the water to prevent rollover.

c. a and b above.

d. Leap from the vehicle before it hits the water.

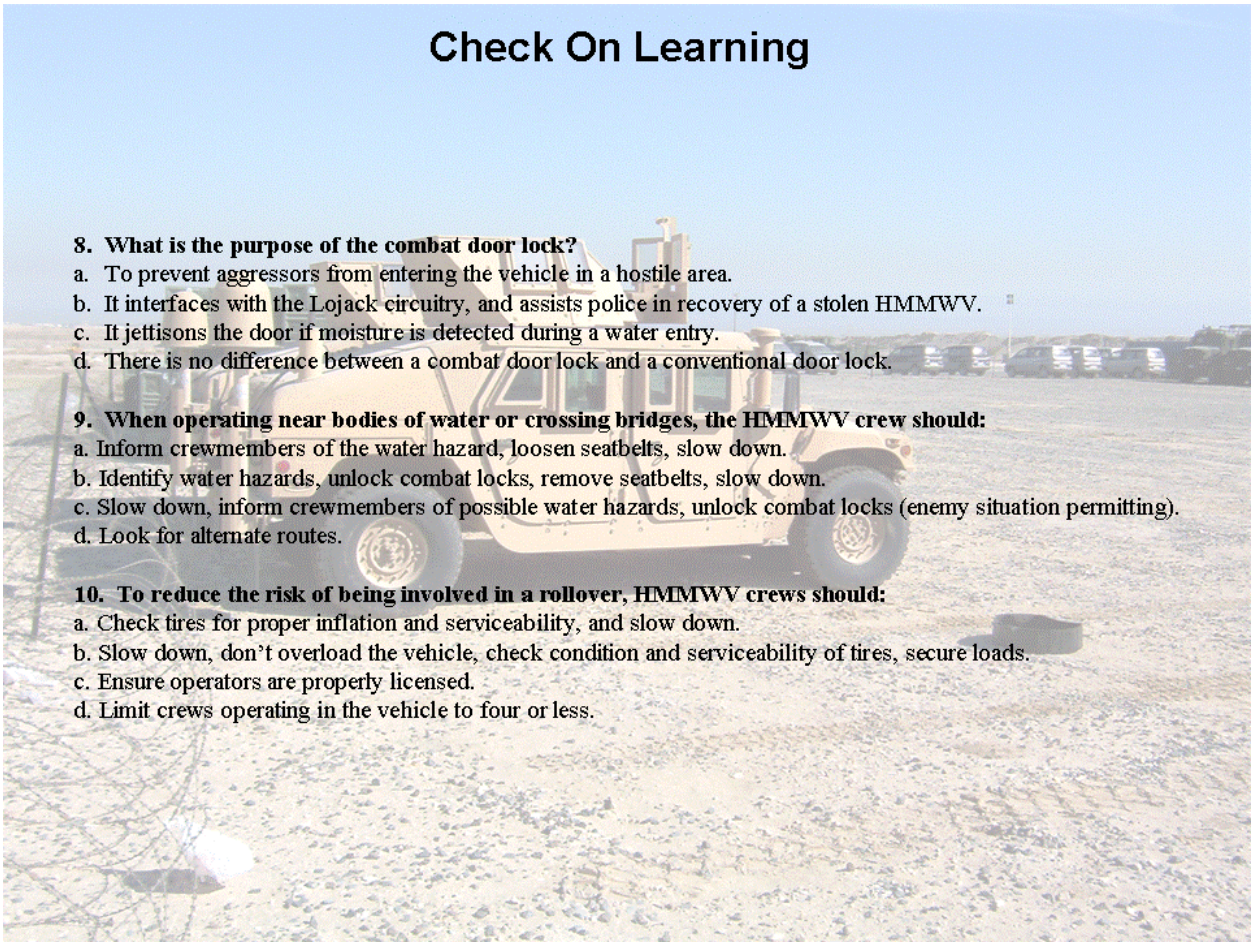
7. Prior to releasing your seatbelt for egress, and immediately afterward, you must:

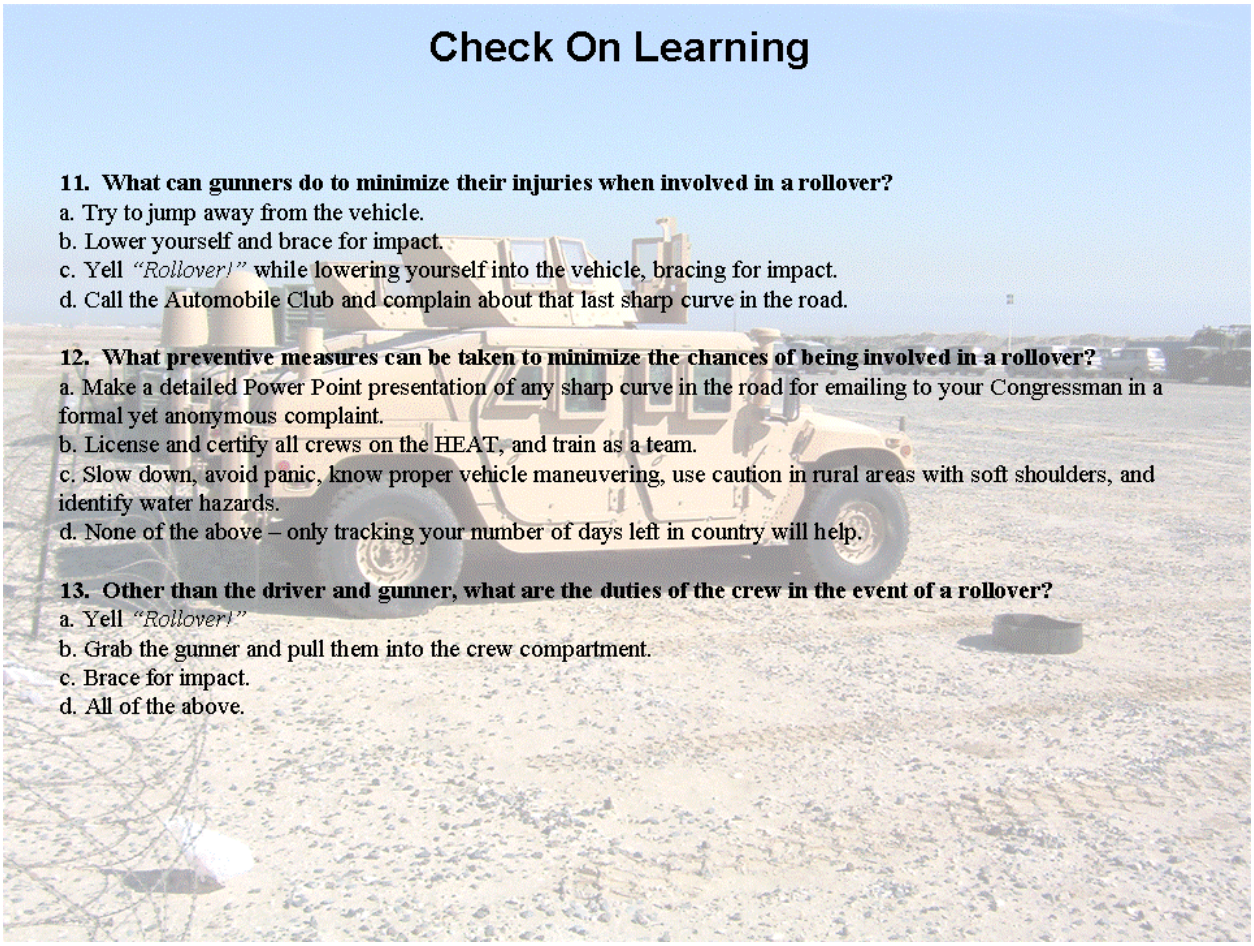
a. Brace with one hand against what was the ceiling (consider which hand you should brace with) – your neck cannot support your body weight during a fall; unfasten your seatbelt with the other hand.

b. Unfasten your seatbelt with one hand, pushing firmly until it pops loose. You may have to push against the floor with your bracing hand to allow the seatbelt to unfasten.

c. a and b above.

d.Take out your k-bar and cut the thing off.


Check On Learning
8. What is the purpose of the combat door lock?
a. To prevent aggressors from entering the vehicle in a hostile area.
b. It interfaces with the Lojack circuitry, and assists police in recovery of a stolen HMMWV.
c. It jettisons the door if moisture is detected during a water entry.
d. There is no difference between a combat door lock and a conventional door lock.
9. When operating near bodies of water or crossing bridges, the HMMWV crew should:
a. Inform crewmembers of the water hazard, loosen seatbelts, slow down.
b. Identify water hazards, unlock combat locks, remove seatbelts, slow down.
c. Slow down, inform crewmembers of possible water hazards, unlock combat locks (enemy situation permitting).
d. Look for alternate routes.
10. To reduce the risk of being involved in a rollover, HMMWV crews should:
a. Check tires for proper inflation and serviceability, and slow down.
b. Slow down, don't overload the vehicle, check condition and serviceability of tires, secure loads.
c. Ensure operators are properly licensed.
d. Limit crews operating in the vehicle to four or less.

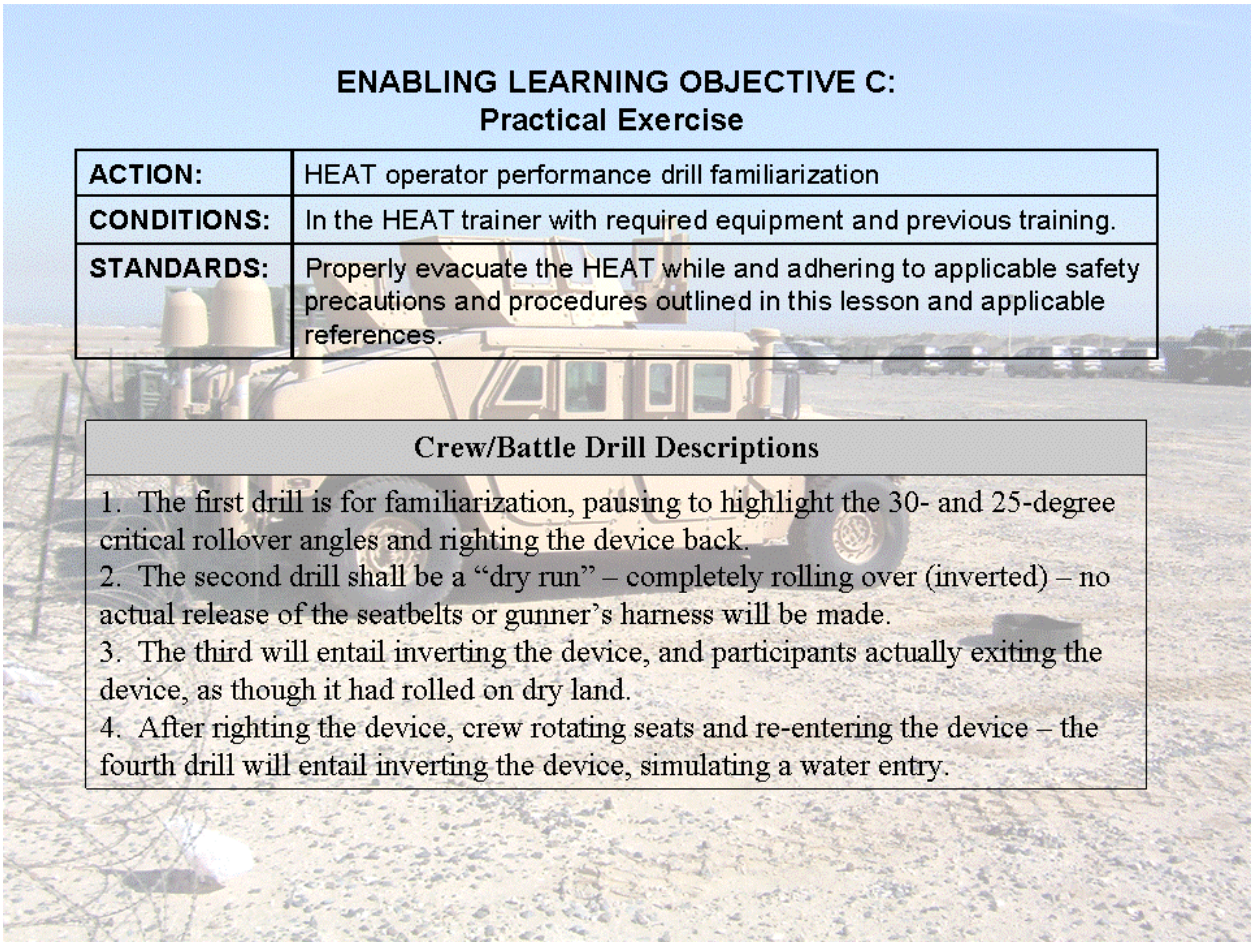


Check On Learning

11. What can gunners do to minimize their injuries when involved in a rollover?
a. Try to jump away from the vehicle.
b. Lower yourself and brace for impact.
c. Yell *"Rollover!"* while lowering yourself into the vehicle, bracing for impact.
d. Call the Automobile Club and complain about that last sharp curve in the road.

12. What preventive measures can be taken to minimize the chances of being involved in a rollover?
a. Make a detailed Power Point presentation of any sharp curve in the road for emailing to your Congressman in a formal yet anonymous complaint.
b. License and certify all crews on the HEAT, and train as a team.
c. Slow down, avoid panic, know proper vehicle maneuvering, use caution in rural areas with soft shoulders, and identify water hazards.
d. None of the above – only tracking your number of days left in country will help.

13. Other than the driver and gunner, what are the duties of the crew in the event of a rollover?
a. Yell *"Rollover!"*
b. Grab the gunner and pull them into the crew compartment.
c. Brace for impact.
d. All of the above.

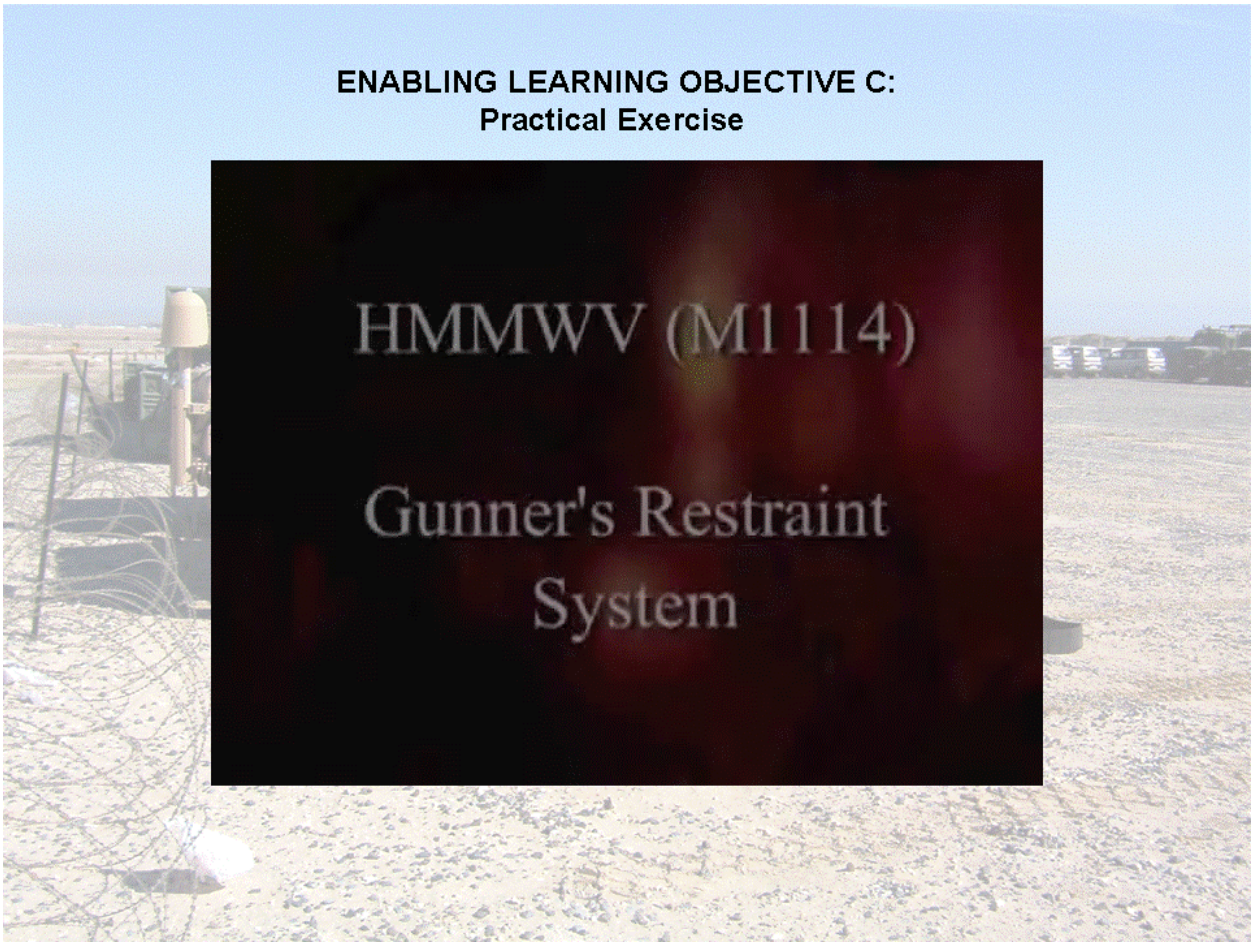


ENABLING LEARNING OBJECTIVE C:
Practical Exercise

ACTION:	HEAT operator performance drill familiarization
CONDITIONS:	In the HEAT trainer with required equipment and previous training.
STANDARDS:	Properly evacuate the HEAT while and adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.

Crew/Battle Drill Descriptions
1. The first drill is for familiarization, pausing to highlight the 30- and 25-degree critical rollover angles and righting the device back. 2. The second drill shall be a "dry run" – completely rolling over (inverted) – no actual release of the seatbelts or gunner's harness will be made. 3. The third will entail inverting the device, and participants actually exiting the device, as though it had rolled on dry land. 4. After righting the device, crew rotating seats and re-entering the device – the fourth drill will entail inverting the device, simulating a water entry.

ENABLING LEARNING OBJECTIVE C:
Practical Exercise



Appendix C - Practical Exercises and Solutions

PRACTICAL EXERCISE(S)/SOLUTION(S) FOR LESSON 1: 551-HEAT version 1.0

PRACTICAL EXERCISE SHEET HEAT PE 1

Title

High Mobility Multipurpose Wheeled Vehicle (HMMWV) Egress Assistance Trainer (HEAT)

Lesson Number / Title

551-HEAT version 1.0 / High Mobility Multipurpose Wheeled Vehicle (HMMWV) Egress Assistance Trainer (HEAT)

Introduction

The purpose of the HEAT PE is to simulate an uparmored HMMWV rollover or roll to left or right, then train the vehicle occupants to successfully egress from the rolled HMMWV by emphasizing teamwork through crew/battle drills.

Motivator

A study reported by *Helicopter World* (now *Defense Helicopter)* magazine in September 2000 said a person who is "egress trained" stands a 250 percent greater chance of survival than an untrained occupant when faced with a rollover egress emergency.

Teaching Soldiers, under controlled training conditions, the proper procedures to egress from an inverted high mobility multipurpose wheeled vehicle (HMMWV) will allow them to achieve self-control and overcome the natural fear and panic following the vehicle rollover. It will also reduce casualties and fatalities resulting from such rollovers, even when the vehicle is under attack, underwater, or on fire.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform clearing and egress procedures with the HEAT.
Conditions:	In the HEAT wearing required combat equipment, given instruction on actions to take to preclude and reactive measures during/after a HMMWV rollover as a HMMWV crewmember.
Standards:	Properly evacuate the HEAT while adhering to applicable safety precautions and procedures outlined in this lesson and applicable references.

Safety Requirements

Medical pre-screening. HEAT training undertaken while being treated by prescription medications, must be done so with the knowledge and approval of the treating physician.

Safety hazard awareness notice. A potential for a mishap during HEAT training is acknowledged. In order to ensure the safety of staff and HEAT Training participant(s), the following considerations will be addressed. . In the event of motion discomfort, the individual – or the unit to which the individual belongs – will be responsible for cleaning the physical evidence (i.e., the release of *any* bodily fluid or compound) of such discomfort before training will continue.

Hazardous conditions and control measures. Students must be informed of any known hazardous conditions and control measures that exist in the training environment. All watches, rings, and jewelry worn around the neck shall be removed; pagers or cell phones removed; and all pockets emptied of contents –

	particularly pens, pencils and pocket knives. Earrings should be removed to prevent inadvertent tearing of the earlobe during inversion and egress from the device. Crewmembers must be briefed of their responsibility to report any unsafe/unhealthful condition they may discover. The instructor will identify the location of emergency equipment, fire exits, and local procedures to be used in the event of a fire, injury, or other emergency. In the event of an **in-HEAT emergency**, (**three blasts** on the whistle or sounding of applicable alarm) **exit the HEAT** immediately and proceed to the pre-designated location. A single long blast is an indication to remain inside the device and *not* open the doors. **First aid treatment** includes oxygen (O) administration, treatment for shock, Cardiopulmonary Resuscitation (CPR) when needed, and transport to the nearest medical treatment facility IAW the Pre-Mishap Plan (Handout 1). **Pre-training requirements**. Prior to engaging in HEAT training, personnel shall be proficient with the wear and operation of standard uniform and combat equipment worn in the theater, and be familiar with survival, signaling and rescue techniques appropriate to survival situations typical of disabled vehicles in the AOR. **Emergency medical personnel.** There will be a minimum of one Combat Lifesaver (CLS) on site during any operation of the HEAT. Ideally, CLS services will be provided by the unit undergoing the training. Emergency medical personnel with appropriate equipment and a suitable vehicle for transport will be readily available during all HEAT training. The absence of any criteria in this paragraph requires a reassessment of the risk and the approval of the appropriate risk approval authority. **Safety reminder.** All personnel will be reminded that personal injury, death, or equipment damage can result from carelessness, failure to comply with the approved procedures, or violations of warnings, cautions, and safety regulations. **HEAT location safeguards.** The HEAT device will be isolated from passers-by to prevent accidental striking by the device when it is in motion.
Risk Assessment	Moderate - CRM is a decision-making process used by leaders to mitigate risks associated with all hazards that can injure or kill people, damage or destroy equipment, or otherwise impact mission effectiveness. CRM must be accomplished using appropriate composite risk management worksheet in the Handout section of this TSP prior to the conduct of this training.
Environmental Considerations	**Environmental Exposure** – Air crewmembers should not participate in flight duties for at least eight hours after completion of HEAT training to ensure stability in the otolith organs of the vestibular system, Aviation/Flight Safety Program and Aviation Accident Prevention Plan {AAPP}, para. 4-9d(1); and FM 3-04.301 Aeromedical Training for Flight Personnel, Chapter 9.
Evaluation	**Debrief.** As the group moves to the debrief, they are observed for signs of motion sickness, given final thoughts from the instructor to reinforce the training they have received, and asked their opinions of how to improve the training.
Instructional	Knowing what actions to take immediately prior to a potential rollover and immediately following a rollover are vital to the safety of the vehicle's crew.

Lead-In	Rollover battle drills, based on unit standing operating procedures (SOP), routinely performed by the vehicle's crew, create understanding of the violent chaos that results when a rollover has occurred and develop skills needed to react to it..
Resource Requirements	**Instructor Materials:** This TSP, TC 55-HEAT **Student Materials:**
Special Instructions	**Conduct HEAT set-up procedures (Handout 8) and PMCS inspection checklist of the HEAT (Handout 4) prior to start of Practical Exercise** a. Demonstrate rollover of device while empty. Observe rollover rate and check for free-floating and unsecured obstacles within the device. b. Inspect the seatbelts and restraints for condition, security, and ease of operation at each position in the HEAT. c. Ensure that the motor controls and electrical connections of the HEAT to the building's electrical outlets are secure and serviceable per theater safety standards. d. The senior HEAT instructor on duty will certify in the logbook that the daily and before-use checks for the device have been completed and that no weekly, monthly, quarterly, or annual inspections/services are overdue.

Procedures

HEAT CREW/BATTLE DRILLS

Crew/Battle Drill Descriptions
1. The first drill is for familiarization, pausing to highlight the 30- and 25-degree critical rollover angles and righting the device back. 2. The second drill shall be a “dry run” – completely rolling over (inverted) – no actual release of the seatbelts or Gunner’s Restraint System/Product Improved Gunner’s Restraint System harness will be made. 3. The third will entail inverting the device, and participants actually exiting the device, as though it had rolled on dry land. 4. After righting the device, crew rotating seats and re-entering the device – the fourth drill will entail inverting the device, simulating a water entry.

INSTRUCTOR PROCEDURES

Conduct all 4 Crew/Battle Drills with each group rotating through the HEAT device

Two HEAT instructors will be present at all times the device is in use. The front instructor (device operator) controls the electric motor for roll operations. Both operators will do a complete walk-around of the device prior to each roll to verify that doors are closed, gunner's hatch mechanism is locked, and crewmembers are in their seats with their seat belts securely fastened. Prior to device operation, both instructors will position themselves on opposite ends of the device, diagonally across from each other, to allow a clear and unobstructed view of both sides of the device to ensure doors remain closed throughout the roll cycle.

The following safety checks must be conducted prior to the start of any training.

Perform safety checks

- Ensure the Gunners cage slider door is in the closed position.
- Ensure the Gunner's hatch on M1114 cab is in the open locked position
- Ensure all windows are up and in the locked position. Have crewmembers response that their window is up and in the locked position.
- Ensure that no personnel or objects are within 6 ft of HEAT assembly during rotation.
- Ensure all personnel are secured to cab assembly using seat belt. Have crew respond seat belts are secure.
- Ensure all doors are combat locked. Have crewmembers confirm the doors are secure. Verify doors are combat locked from the crew display panel.
- Check with assistant operator/trainer that all is clear.
- Check that motor switch is in the off position.

1. The VC position will always be manned if there is more than one person in the device. The VC is responsible for ensuring all personnel within the HEAT are buckled in, the gunner is properly restrained, and the combat locks are engaged on all doors.

2. The device operator communicates using the intercom system with the HEAT occupants verifying all seatbelts are secured and ensures display screen indicates all doors are locked. Identify E-stops inside HEAT to ensure occupants understand how to stop the device in case of emergency.

3. Once all positions report ready to the HEAT operator, they will use the intercom system to signal rotation is about to begin. They will then notify the assistant instructor and only then is the device ready for operation.

4. When the crewmembers are ready, the device operator rotates the simulator either to the left or to the right. Crewmembers should lower their chins to their chests, pull their arms across their chests, and brace their legs against the floor without locking their knees. Once the rolling has stopped and the device is in the desired position to complete the crew/battle drill, the HEAT operator uses the intercom system to signal to Crewmembers to begin the drill. Crew-members should wait three to five seconds to orient themselves; brace against the ceiling with one hand, then release the restraint belts with their other hand. Next, they will pull down free of the seat and rotate to a horizontal face-down position while holding onto a reference point with both hands. The crew then proceeds with an egress per the scenario for the exercise.

SOLUTION FOR
PRACTICAL EXERCISE SHEET HEAT PE 1

Sample Training Scenarios

NOTES: Prior to all Scenarios, students shall conduct a pre-rotation check of their gear by using the "buddy system". Any loose or hanging items should be fixed or removed at this time.

Scenario 1 - Orientation Scenario

NOTES: This scenario should be used to identify any potential for students to experience motion sickness or claustrophobia. This scenario should be done at the beginning of every groups training session.

1. Rotate the trainer and stop at 25°. Identify this as the critical rollover angle of the uparmored HMMWV.

2. Asses Students for any Illness or problems

3. Rotate the trainer and stop at 90°

4. Asses Students for any Illness or problems

5. Rotate the trainer and stop at 180°

6. Asses Students for any Illness or problems

7. Rotate trainer and stop at 360°

8. Scenario complete

Scenario 2- HMMWV Rollover to 180° BASIC

NOTES: *After the vehicle has come to a resting position the lead instructor will only unlock the driver's door. When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

1. Rotate the trainer 180°
2. Stop the trainer at the 180° position.
3. *Unlock only one of the doors.
4. Signal students to egress the vehicle
5. Observe and assist students as required.
6. After egressing have students set up security and conduct accountability checks.
7. Conduct After Action Review

Scenario 3 - IED explosion causes HMMWV rollover to 180° with (1) injured but conscious Soldier

NOTES: Before the students load the vehicle, identify and instruct one of the students that he/she will be simulating an injured soldier. Instruct the student to verbalize an injury when the vehicle comes to a rest. Instruct the "injured soldier" that they are to offer absolutely no help to the other students. The other students will have to get him/her out of the seatbelt and vehicle

*After the vehicle has come to a resting position the lead instructor will only unlock one door. This is done to simulate jammed or damaged doors that cannot be opened.

1. Rotate the trainer
2. Stop the trainer at the 180° position.
3. *Unlock only one of the doors.
4. Signal students to egress the vehicle
5. Observe and assist students as required.
6. After egressing have students set up security, treat/request MEDEVAC for casualties and conduct accountability checks.
7. Conduct After Action Review

Scenario 4 - IED explosion causes HMMWV rollover to 180° with (2) injured but conscious Soldiers

NOTES: Before the students load the vehicle, identify and instruct two of the students that they will be simulating injured soldiers. Instruct the students to verbalize an injury when the vehicle comes to a rest. Instruct the "injured soldiers" that they are to offer absolutely no help to the other students. The other students will have to get them out of the seatbelt and vehicle.

*After the vehicle has come to a resting position the lead instructor will only unlock one door. This is done to simulate jammed or damaged doors that cannot be opened.

1. Rotate the trainer
2. Stop the trainer at the 180° position.
3. *Unlock only one of the doors.
4. Signal students to egress the vehicle
5. Observe and assist students as required.
6. After egressing have students set up security, treat/request MEDEVAC for casualties and conduct accountability checks.
7. Conduct After Action Review

Scenario 5 - IED explosion causes HMMWV Rollover to 180° with (1) injured and unconscious Soldier

NOTES: Before the students load the vehicle, identify and instruct one of the students that he/she will be simulating an unconscious soldier. Instruct the student to do absolutely nothing when the trainer comes to a rest. Ensure the "unconscious soldier" does not speak or offer any type of help to the other students. The other students will have to get him/her out of the seatbelt and vehicle.

* After the vehicle has come to a resting position the lead instructor will only unlock one door. This is done to simulate jammed or damaged doors that cannot be opened.

1. Rotate the trainer
2. Stop the trainer at the 180° position.
3. *Unlock the driver's door.
4. Signal students to egress the vehicle
5. Observe and assist students as required.
6. After egressing have students set up security, treat/request MEDEVAC for casualties and conduct accountability checks.
7. Conduct After Action Review

Scenario 6 - IED explosion causes HMMWV Rollover to 180° with (2) injured and unconscious Soldier

NOTES: Before the students load the vehicle, identify and instruct two of the students that they will be simulating unconscious soldiers. Instruct the students to do absolutely nothing when the trainer comes to a rest. Ensure the "unconscious soldiers" do not speak or offer any type of help to the other students. The other students will have to get them out of the seatbelt and vehicle.

* After the vehicle has come to a resting position the lead instructor will only unlock one door. This is done to simulate jammed or damaged doors that cannot be opened.

1. Rotate the trainer
2. Stop the trainer at the 180° position.
3. *Unlock the driver's door.
4. Signal students to egress
5. Observe and assist students as required.
6. After egressing have students set up security, treat/request MEDEVAC for casualties and conduct accountability checks.
7. Conduct After Action Review

WARNING: 90° Egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° Egress training being started. Egress will only be done through the Gunner's Hatch.

Scenario 7- HMMWV Rollover to 90° BASIC

NOTES: *After the vehicle has come to a resting position the lead instructor will only unlock the driver's door. When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

1. Rotate the trainer
2. Stop the trainer at the 90° position.
3. Signal students to egress the vehicle
4. Observe and assist students as required.
5. After egressing have students set up security and conduct accountability checks.
6. Conduct After Action Review

WARNING: 90° Egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° Egress training being started. Egress will only be done through the Gunner's Hatch.

Scenario 8- IED explosion causes HMMWV rollover to 90° with (1) injured but conscious Soldier

NOTES: Before the students load the vehicle, identify and instruct one of the students that he/she will be simulating an injured soldier. Instruct the student to scream when the vehicle comes to a rest. Instruct the "injured soldier" that he/she is to offer absolutely no help to the other students. The other students will have to get him/her out of the seatbelt and vehicle.

*After the vehicle has come to a resting position the lead instructor will only unlock the driver's door. When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

1. Rotate the trainer
2. Stop the trainer at the 90° position.
3. Signal students to egress the vehicle
4. Observe and assist students as required.
5. After egressing have students set up security, treat/request MEDEVAC for casualties and conduct accountability checks.
6. Conduct After Action Review

WARNING: 90° Egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° Egress training being started. Egress will only be done through the Gunner's Hatch.

Scenario 9 - IED explosion causes HMMWV rollover to 90° with (2) injured but conscious Soldiers

NOTES: Before the students load the vehicle, identify and instruct two of the students that they will be simulating injured soldiers. Instruct the students to scream when the vehicle comes to a rest. Instruct the "injured soldiers" that they are to offer absolutely no help to the other students. The other students will have to get them out of the seatbelt and vehicle.

*After the vehicle has come to a resting position the lead instructor will only unlock the driver's door. When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

1. Rotate the trainer
2. Stop the trainer at the 90° position.
3. Signal students to egress the vehicle
4. Observe and assist students as required.
5. After egressing have students set up security, treat/request MEDEVAC for casualties and conduct accountability checks.
6. Conduct After Action Review

WARNING: 90° Egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° Egress training being started. Egress will only be done through the Gunner's Hatch.

Scenario 10- IED explosion causes HMMWV Rollover to 90° with (1) injured and unconscious Soldier

NOTES: Before the students load the vehicle, identify and instruct one of the students that he/she will be simulating an unconscious soldier. Instruct the student to do absolutely nothing when the trainer comes to a rest. Ensure the "unconscious soldier" does not speak or offer any type of help to the other students. The other students will have to get him/her out of the seatbelt and vehicle.

* After the vehicle has come to a resting position the lead instructor will only unlock the driver's door. When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

1. Rotate the trainer
2. Stop the trainer at the 90° position.
3. Signal students to egress the vehicle
4. Observe and assist students as required.
5. After egressing have students set up security, treat/request MEDEVAC for casualties and conduct accountability checks.
6. Conduct After Action Review

WARNING: 90° Egress is extremely dangerous and must only be conducted with the approval of the commander. An additional risk assessment must be done prior to the conduct of any 90° Egress training being started. Egress will only be done through the Gunner's Hatch.

Scenario 11 - IED explosion causes HMMWV Rollover to 90° with (2) injured and unconscious Soldier

NOTES: Before the students load the vehicle, identify and instruct two of the students that they will be simulating unconscious soldiers. Instruct the students to do absolutely nothing when the trainer comes to a rest. Ensure the "unconscious soldiers" do not speak or offer any type of help to the other students. The other students will have to get them out of the seatbelt and vehicle

*After the vehicle has come to a resting position the lead instructor will only unlock the driver's door. When students egress out of the vehicle, make sure they only use the vehicles frame to egress.

1. Rotate the trainer
2. Stop the trainer at the 90° position.
3. Signal students to egress the vehicle
4. Observe and assist students as required.
5. After egressing have students set up security, treat/request MEDEVAC for casualties and conduct accountability checks.
6. Conduct After Action Review

Appendix D - Student Handouts

HANDOUTS FOR LESSON 1: 551-HEAT version 1.0

Handout 1

HEAT PRE-MISHAP PLAN

Instructions: The blank spaces are to be completed prior to undertaking any training in the HEAT, and this form is ***conspicuously posted*** for ready reference in the event of a mishap.

1. Non-HEAT related injuries.
   a. All non-HEAT related injuries (injuries not associated with the device itself), will be handled at the facility and transported (ambulance _____) to the nearest clinic or treatment center, as necessary.

2. HEAT-related injury.

HEAT *impact* injuries	**HEAT *non-impact* injuries**
Head injuries	Vision blurriness consistent with red-out (from inversion)
Neck injuries	Chest pain or headache (consistent with cardio distress or stroke)
Back injuries	Flank or chest pain
Partial or full paralysis	Numbness/tingling in extremities
Falls from height	Dipnea (shortness of breath)
Any neurological deficit	Any cut, abrasion or bruise (not known to be from an impact)
Any cut, abrasion or bruise (known to be from an impact)	Crushing, pinching, or punctures known not to be from an impact
Strike by a falling or flying object	

a. If a HEAT-related injury is suspected:

(1) Administer first aid, and – if available – $_{Oxygen}$ by mask.
(2) Call nearest MEDEVAC Unit (_____).
(3) Advise Commander (_____), Safety Officer (_____), and nearest attending physician (_____).

3. Specify the type and cause (i.e., impact or non-impact) when calling for emergency medical services, and reporting the mishap through the Safety Office.

4. All injuries – no matter how slight – must be reported. This assists in the development of administrative and engineering controls necessary to avoid future mishaps. All damage to the device must be reported.

CLASS E MISHAP REPORTING FORM
(For use in reporting non-aviation mishaps costing the Government less than $2,000, or not otherwise qualifying as a Class D mishap. Not for use in reporting Class E Army Aviation mishaps, which are required to be reported on a DA Form 2379-AB-R [Abbreviated Aviation Accident Report (AAAR)] IAW DA Pam 385-40).

SECURITY CLASSIFICATION OF FORM	

1. Date and Local Time of Mishap:
2. Location of Mishap *(address, building number and installation, grid, etc.)*:
3. Number of, and type of injuries (e.g., *"One cut finger")*, if any. If more than one injured person, list them as *"1.", "2"*, etc. Specify whether the injury is a HEAT impact or non-impact injury. If no injuries, write *"None"*.
4. Rank and name of individuals involved in the mishap. Correspond them to block 3 above (e.g., *"1. SGT Adam Burkholder; 2b. SFC Richard Wolfe"*).
5. Indicate any military or civilian equipment damaged, and describe the damage. If none, write *"None".*
6. Describe what happened, and the events that led up to the mishap. Use additional sheets of paper if necessary.
7. How do you think this mishap could have been prevented?

8a. Rank and Name of person reporting mishap:	
8b. Phone number (DSN or commercial) where you may be reached.	

DO NOT WRITE BELOW THIS LINE – FOR USE BY SAFETY OFFICE(R).

9a. Rank and Name of Safety Officer receiving and investigating mishap:	
9b. Date received:	
9c. Date Investigation completed, filed:	
9d. Cross-referenced LODs or other mishap reports (e.g., SFs 91, AGARs):	

FORM ROUTING: Unit Safety Officer review and complete form, route *through* Command Channels *to* Safety Officer

Handout 3

HEAT TRAINING PARTICIPANT SCREENING SHEET

_____

NAME (LAST, FIRST MI) SSN: RANK:

UNIT_____ AGE _____ DATE OF LAST PHYSICAL _____

MEDICAL STATUS (Profiles): _____

1	Have you been physically ill in the last two weeks?	Y	N
2	Have you taken any medications in the last 24 hours?	Y	N
3	Are you presently under any medical treatment or (aircrews) have you been medically grounded in the last 30 days?	Y	N
4	Have you had any shots or immunizations in the past 12 hours?	Y	N
5	Have you had any dental work in the past seven days?	Y	N
6	Have you donated blood in the last seven days?	Y	N
7	Have you had less than your normal amount of sleep in the last two nights?	Y	N
8	Have you had any alcohol in the last 12 hours?	Y	N
9	Have you changed your eating habits in the last 24 hours?	Y	N
10	Do you have any physical condition which might be aggravated by this training?	Y	N
11	Have you had any back or joint trouble in the last 30 days?	Y	N
12	Have you had any head, neck, back, or any major previous bone fracture?	Y	N
	If so, have you been released for such activity by a Competent Medical Authority?	Y	N
13	For women: Are you pregnant?	Y	N
14	Do you have any physical condition not noted above?	Y	N
15	Have you ever had a traumatic experience in vehicles and/or do you have any fear associated with being in a tactical vehicle, such as a HMMWV?	Y	N
16	Is there any reason why you should not participate in training today?	Y	N
17	Have you previously requested to drop from any HEAT/egress training?	Y	N
18	Do you suffer from motion sickness?	Y	N
19	Are you claustrophobic?	Y	N

Note: If you marked *yes* to any one of these questions, please provide explanation in the remarks section identifying by number the question to which reference is made.

REMARKS(cont on back)

If my medical status should change during this course of training, I will immediately report my status to the Lead HEAT Instructor.

_____ _____

Signature Date

Handout 4

ITEM NO	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF
1.	Before	**Cab Assembly**	Visibly check for cracks dents and sharp edges	If cracked or sharp edges are found
	Before	a. Cab Mounts, and Retaining Bracket hardware	Loose, Missing or Damaged Hardware	Loose or missing or damaged hardware
	Before	b. Seatbelts	Loose, Missing or Damaged Hardware	Loose or missing or damaged hardware
	Before	c. Cameras	Check for cracks dirt or damage. Missing rubber protection bumper pads.	Cracked, Dirty or damage. Missing rubber protection bumper pads
	Before	d. BII Items	Check that all BII items are securely stowed	Un-stowed Items
	Before	e. Speakers and Microphone	***note requires two personnel** Check speakers and microphone for loose or missing or damaged hardware and function correctly	Loose or missing or damaged hardware Not Function Properly
	Before	f. Doors, Windows and Gunner's Hatch	Check operation of doors, windows and gunner's hatch	Not Function Properly
2.	Before	**Base Weldment**	Visible check for cracks dents and sharp edges	If cracked or sharp edges are found
	Before	a. Gunner's cage Locking Pins	Loose, Missing or Damaged Hardware	Loose or missing or damaged hardware Not Function Properly
	Before	b. Inspect front AV Power Outlet	Loose, Missing or Damaged Hardware	Loose or missing or damaged hardware Not Function Properly
3.		**Stand Weldment**	Visible check for cracks dents and sharp edges	If cracked or sharp edges are found
	Before	a. Inspect Adjustable Lifting Point, PIN and Hardware	Loose, Missing or Damaged Hardware	Loose or missing or damaged hardware Not Function Properly
	Before	b. Side platform motion	Loose, Missing or Damaged Hardware Check binding and rolling out and in function	Loose or missing or damaged hardware Not Function Properly
	Before	c. Side platform Steps and Leg Supports	Loose, Missing or Damaged Hardware Check binding and rolling out and in function	Loose or missing or damaged hardware Not Function Properly
	Before	d. Side platform Roller Guilds	Loose, Missing or Damaged Hardware	Loose or missing or

ITEM NO	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF
		and Supports Rollers	Check for serviceable Guilds and Rollers	damaged hardware Un-Serviceable
	Before	e. Side platform Locking Pins	Loose, Missing or Damaged Hardware Check Side platform Locking Pin function	Loose or missing or damaged hardware Not Function Properly
4.	Before	**Upper and Lower Cab Support Weldment**	Visible check for cracks dents and sharp edges	If cracked or sharp edges are found
	Before	Inspect Screws washer and Nuts	Loose, Missing or Damaged Hardware	Loose or missing or damaged hardware
5.	Before	**Gunner's Cadge Escape Slider Door**	Loose, Missing or Damaged Hardware Open and Close Slider Door	Loose or missing hardware Not Function Properly
6.	Before	**Encoder**	Loose, Missing or Damaged Hardware or Worn Belt	Missing or Damaged Belt
7.	Before	**Front Operators Controls**	Loose, Missing or Damaged Hardware	Loose or missing hardware
8.	Before	**Batteries and Components**		
	Before	a. Battery hold down straps and hardware	Check for missing or damaged battery hold down straps.	Missing or Damaged
	Before	b. NATO adapter and battery cables	Check for missing, loose, or damaged NATO adapter and battery cables	Loose, Missing or Damaged
	Before	c. Battery Box	Check for missing, loose, or damaged battery box	Loose, Missing or Damaged
	Before	**Front Operators Controls Continued** a. Function Test	**WARNING** **This is done without Crewmembers in Cab Assembly. Failure to comply may cause injury or death to crewmembers** Attempt function Test	Not Function Properly
9.	During	Crew Display Panel	Check for open doors, battle over ride or e-stops display on panel	Not Function Properly
10	During	Battery Bar Gauge	Check Battery bar gauge does not go below three	Notify field Maintenance

ITEM NO	INTERVAL	ITEM TO CHECK/SERVICE	PROCEDURE	NOT FULLY MISSION CAPABLE IF
			bars.	
11	During	Rotation	Check HEAT assembly for any unusual noise or excessive vibration during rotation.	Notify field Maintenance
12	After	HEAT Assembly	Clean Entire HEAT Assembly	Inner Cab Debris
13	Monthly	Gearbox Lubrication	Check For proper Fluid amount	Not Full
14	Monthly	HEAT Assembly: Paint, BII and Rubber Protective items	Check for missing, loose, or damaged Paint, BII and Rubber Protective items	Damaged

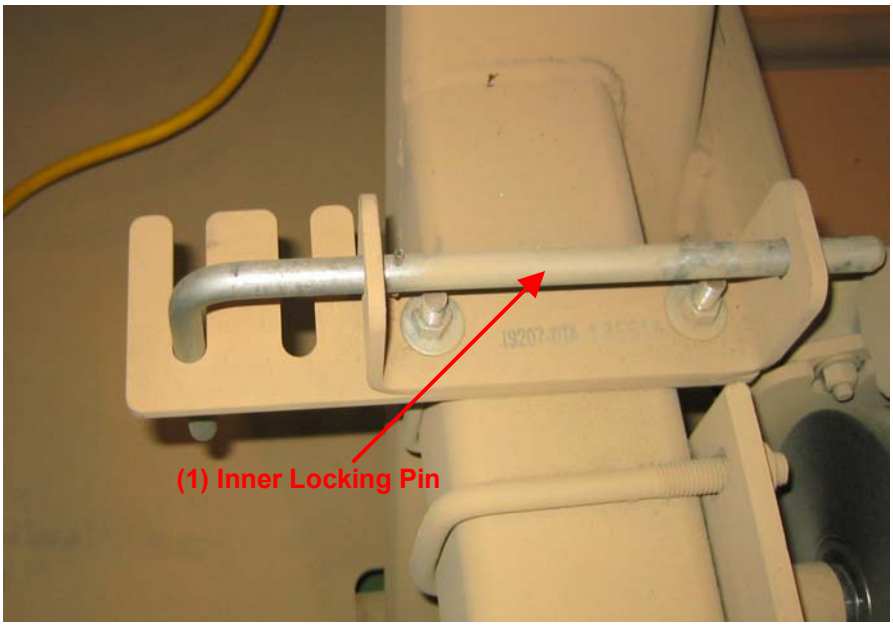
Handout 5

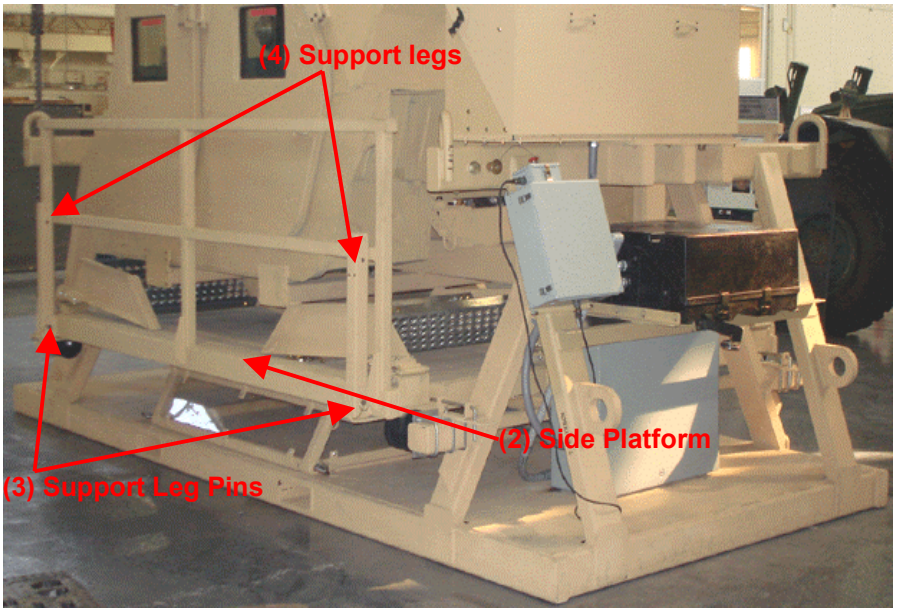
HEAT pre-operational use and set-up procedures

NOTE

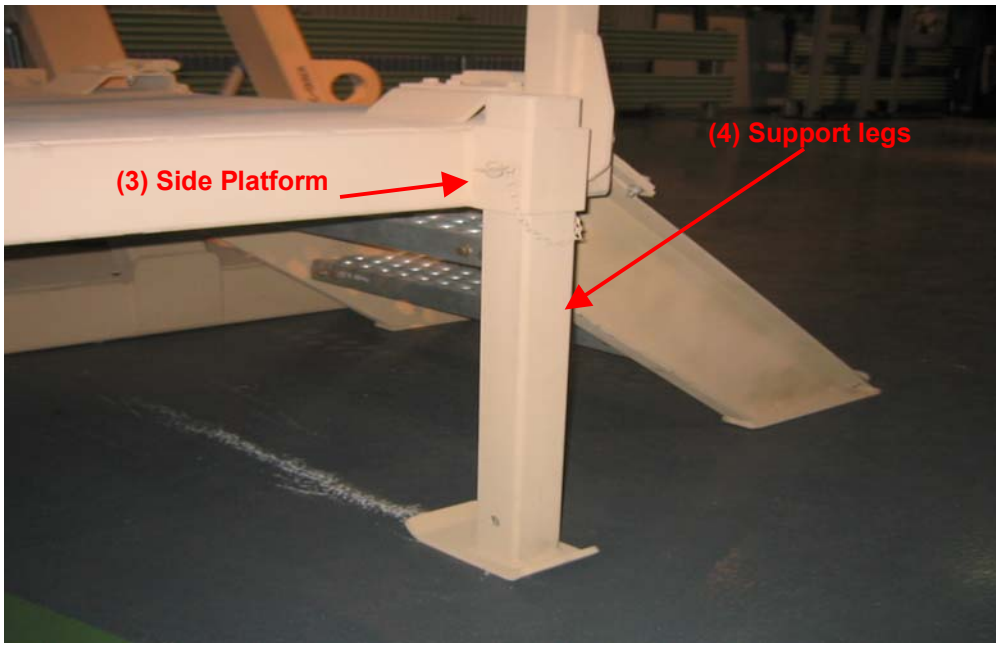
Only one platform is shown below. The side platforms are identical on both sides. This procedure covers the platforms setup. Only one platform locking pin location is shown below. The locking pins are both located to the left and right sides of the platform.

1. Remove two inner platform locking pins (1) from each side of platforms.

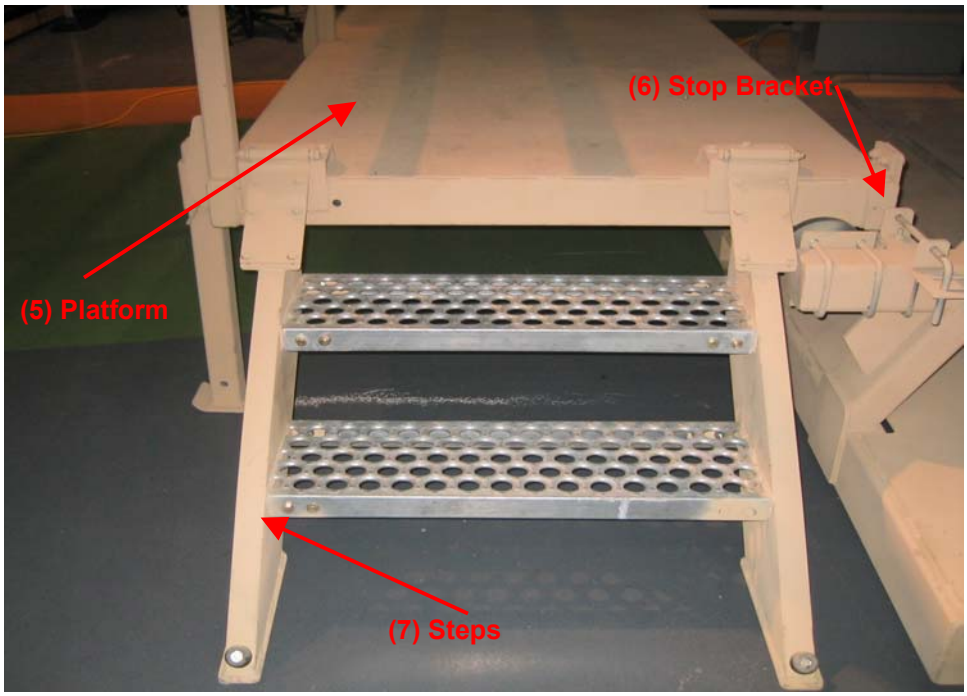




2. Remove pins (3) from support legs (front and rear) (4).
3. Lower support leg (front and rear) (4) so upper hole on leg aligns with hole on side platform (3).



4. Install pin though side platform (3) and support leg (4).



NOTE

All support legs and steps are raised and lowered in the exactly same way. The support legs and steps are shown in the lowered position.

Side Platform (Outward Position)

5. Using both personnel grasp each end of platform (5) and pull outward until fully extended to stop bracket (6).
6. Grasp steps (7) and rotate to ground.

Side Platforms Stowed/Platforms are in the outward position

1. Grasp steps (7) and rotate steps on to platform.

NOTE

Only one platform is shown below. The side platforms are identical on both sides. This procedure covers the platforms setup. Only one platform locking pin location is shown below. The locking pins are both located to the left and right sides of the platform.

2. Using both personnel grasp each end of platform (5) and push inward until the platform is fully under cab assembly (6).

NOTE

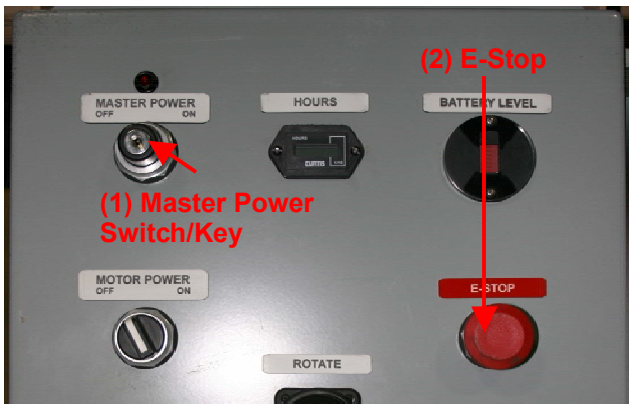
All support legs and steps are raised and lowered in the exactly same way. The support legs and steps are shown in the lowered position.

3. Remove pin inside platform (3) and support leg (4).
4. Raise support leg (front and rear) (4) so lower hole on leg aligns with hole on side platform (3).
5. Replace pins (3) into support legs (front and rear) (4).
6. Insert two inner locking pins (1) in each side of the platforms.

Connect Power Cable Using 110v Wall Outlet

WARNING

All control switches must be in the off position before connecting power cord to wall outlet. Failure to place control switches in the off position may result in injury or death to personnel.

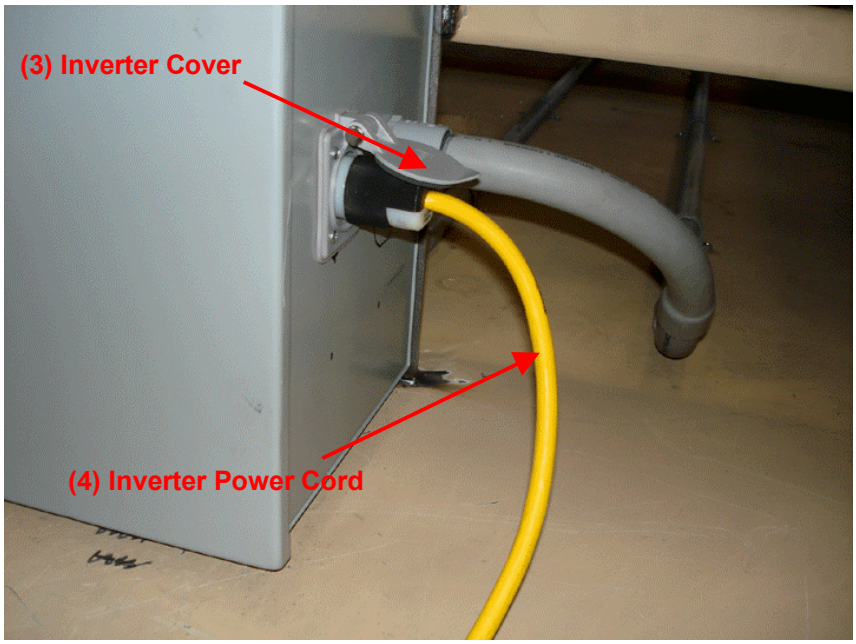


1. Check that master power switch/key (1) is removed from operator's control panel.
2. Check that E-stop (2) is pushed in.
3. Raise power inverter cover (3) and connect yellow power inverter cord (4) to inverter.

WARNING

Ensure that the power outlet being used for the HEAT is powered by a minimum of a 15 amp circuit breaker. Failure to comply may result in injury or death to personnel or damage to equipment.

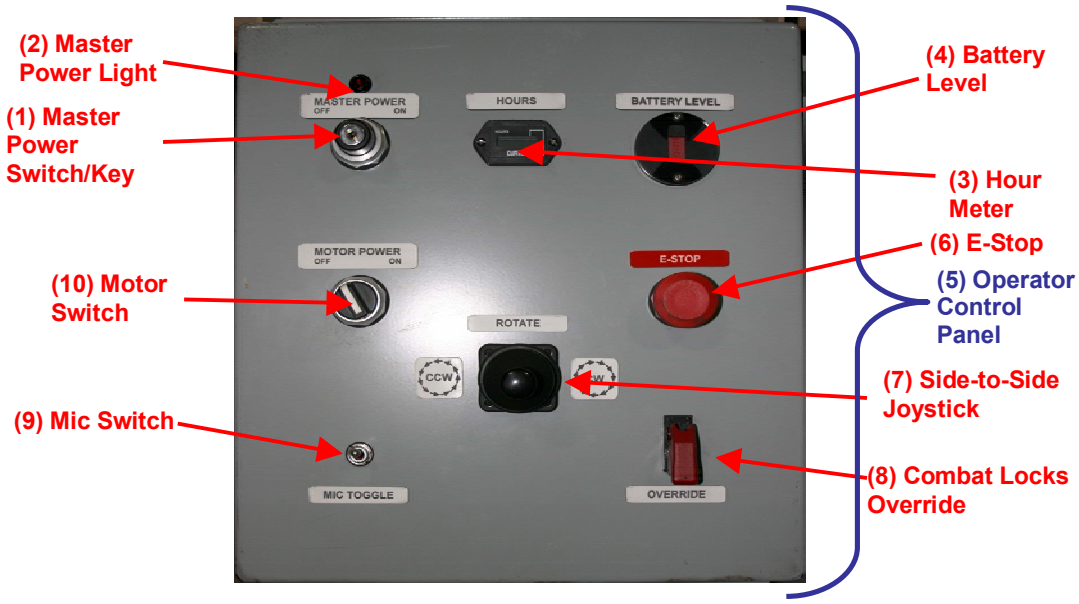
1. Connect power extension cord (5) to 15 amp 110v wall outlet.



DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

Operator's Control Panel

1. **MASTER POWER SWITCH/KEY—** This is a two position key operated master power switch. Used or turning master power on and off. The off position is key turned all the way to the left and the on position is key turned all the way to the right
2. **MASTER POWER LIGHT—** This light will illuminate amber when master power switch/key is turned the on position.
3. **HOUR METER—** The meter displays hour of HEAT operation. The hour meter starts adding whenever the master power switch/key is turned the on position.
4. **BATTERY LEVEL INDICATOR—** This displays current battery level charge once master power switch/key is turned the on position.
5. **OPERATOR CONTROL PANEL—** Contains instrument gauges, switches, and indicator lights used during HEAT operation.
6. **E-STOP—** This is a two position pushbutton operated button. Pushed in, this is used in any emergency situation to stop the rotation of the HEAT cab assembly, also used during procedure as a safety precaution. Pulled out allows HEAT to resume operations.
7. **SIDE-TO-SIDE JOYSTICK—** The joystick is spring loaded to return to center position when released. Moving the jot stick left rotates HEAT cab assembly counter clockwise (CCW). Moving the jot stick right rotates HEAT cab assembly clockwise (CW.
8. **COMBAT LOCKS OVERIDE—** The switch has a red safety cover that must be flipped up before use. This switch is spring loaded and is used joystick is spring loaded to return to center position when released. Moving the jot stick left rotates HEAT cab assembly counter clockwise (CCW). Moving the jot stick right rotates HEAT cab assembly clockwise (CW.
9. **MIC SWITCH—** This switch is spring loaded and is used in the up position the communicate to the crewmembers inside the M1114 cab assembly.
10. **MOTOR SWITCH—** This is a two position on / off switch. When turned to the right, on position the switch activates a relay to energize the motor and side to side joystick.



Handout 6

Item	Instructions
1 through 4	Self Explanatory
5	Subtask relating to the mission or task in Block 1.
6	Hazards – Identify hazards by reviewing METT-TC factors for the mission or task. Additional factors include historical lessons learned, experience, judgment, equipment characteristics and warnings, and environmental considerations.
7	Initial Risk Level– Includes historical lessons learned; intuitive analyses, experience, judgment, equipment characteristics and warnings; and environmental considerations. Determine initial risk for each hazard by applying risk assessment matrix (Figure 1-1). Enter the risk level for each hazard.
8	Controls – Develop one or more controls for each hazard that will either eliminate the hazard or reduce the risk (probability and/or severity) of a hazardous incident. Specify who, what, where, why, when, and how for each control. Enter controls.
9	Residual Risk Level– Determine the residual risk for each hazard by applying the risk assessment matrix (Figure 1-1). Enter the residual risk level for each hazard.
10	How to Implement – Decide how each control will be put into effect or communicated to the personnel who will make it happen (written or verbal instruction; tactical, safety, garrison SOPs, rehearsals). Enter controls.
11	How to Supervise (Who) –Plan how each control will be monitored for implementation (continuous supervision, spot-checks) and reassess hazards as the situation changes. Determine if the controls worked and if they can be improved. Pass on lessons learned.
12	Was Control Effective – Indicate “Yes” or “No.” Review During AAR.
13	Overall Risk Level – Select the highest residual risk level and circle it. This becomes the overall mission or task risk level. The commander decides

	whether the controls are sufficient to accept the level of residual risk. If the risk is too great to continue the mission or task, the commander directs development of additional controls or modifies, changes, or rejects the COA.
14	Risk Decision Authority – Signed by the appropriate level of command.

Handout 7

COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC.

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED *(YYYYMMDD)*
Conduct HMMWV Egress Assistance Traininer (HEAT) training			

4. PREPARED BY

a. LAST NAME	b. RANK	c. POSITION

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFEC-TIVE?
	Adverse weather rain, lightning, cold, heat.	M	Obtain weather/wet bulb report. Ensure students have gear for season.	L	Conduct safety briefing prior to training.	Operator/Instructor	
Mounting or Dismounting HEAT	Trips, falls and impact caused by swinging HEAT cab	H	HEAT must be secure from rotation or sway with a positive lock before Soldier	L	Device has positive lock at multiple positions; 0, 90,180 degrees.	OIC, PI, or Safety preoperational inspection daily.	
Mounting or Dismounting HEAT	Fall and impact from stepping / climbing up to enter / exit cab above ground	H	Use steps or ladder	L	Provide securable steps or ladder.	OIC, PI, or Safety inspect for availability and serviceability.	
Mounting or Dismounting HEAT	Scrapes and cuts from sharp edges of HEAT body interior and exterior.	M	File or grind all sharp edges on inside, passages, doors and turret. Any where a Soldier may interface with the device; mounting or	L	OIC, PI, or Safety inspects HEAT before use. Tags out edge and makes repairs before use.	OIC, PI, or Safety inspect before and after operation and tags out sharp edge with sufficient protection.	
Rotating HEAT	Fall / ejected from HEAT	H	Use and check the seat belts and door locks and latches	M	Inspect belts, locks and retractor before and after each rotation with Soldiers.	OIC, PI, or Safety inspects before and after each rotation.	
Rotation of HEAT	Injuries sustained from loss of motor control or braking.	H	Inspect and service motor drive and brake system for potential failure.	M	Pre-operational inspection checklist	OIC, PI, or Safety conducts pre-operations inspection.	

Additional space for entries in Items 5 through 11 is provided on Page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED *(Check one)*

☐ LOW ☒ MODERATE ☐ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE

ITEMS 5 THROUGH 12 CONTINUED:

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFEC-TIVE?
Rotating HEAT	Scrape, cuts, bruises, neck, back, finger injuries.	H	First Aid personnel or Combat Lifesaver are present before and during rotation.	M	Arrange for proper level of medical response either by the installation or unit. Part or pre-ops checklist.	OIC, PI, or Safety confirms presence of medical response.	
Rotating HEAT	Scrape, cuts, bruises, neck, back, finger injuries.	H	Ensure seat belts are serviceable, secure, and tight. Rotate HEAT Slowly.	M	Make part of check list for before operations training.	OIC, PI, or Safety inspections before operations	
Dismounting HEAT	Injuries sustained from falling out onto hard floor.	M	Use foam or rubber mating to reduce injuries from falls.	L	Pre-operational inspection of floor protection before operations.	OIC, PI, or Safety inspections before operations	

COMPOSITE RISK MANAGEMENT WORKSHEET

For use of this form, see FM 5-19; the proponent agency is TRADOC.

1. MSN/TASK	2a. DTG BEGIN	2b. DTG END	3. DATE PREPARED *(YYYYMMDD)*

4. PREPARED BY

a. LAST NAME	b. RANK	c. POSITION

5. SUBTASK	6. HAZARDS	7. INITIAL RISK LEVEL	8. CONTROLS	9. RESIDUAL RISK LEVEL	10. HOW TO IMPLEMENT	11. HOW TO SUPERVISE (WHO)	12. WAS CONTROL EFFEC-TIVE?

Additional space for entries in Items 5 through 11 is provided on Page 2.

13. OVERALL RISK LEVEL AFTER CONTROLS ARE IMPLEMENTED *(Check one)*

☐ LOW ☐ MODERATE ☐ HIGH ☐ EXTREMELY HIGH

14. RISK DECISION AUTHORITY

a. LAST NAME	b. RANK	c. DUTY POSITION	d. SIGNATURE

DA FORM 7566, APR 2005